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REGISTRATION OF FEMALE GENITAL CANCER IN AUSTRALIA.¹

By K. A. MCGARRITY, F.R.C.O.G.,
Sydney.

THE problem of registration of genital cancer in Australia today is a pressing one, as there is a real need for some type of mobilization of the statistics relating to incidence, cure rate and geographical distribution, by age, race *et cetera*, and associated symptomatology, endocrinology *et cetera*.

This genital cancer registry has the following purposes: (i) to establish a uniform method of recording all cases of genital cancer throughout Australia; (ii) to provide a system from which research workers may make comprehensive surveys of the foregoing statistical data and their relationship to genital cancer; (iii) to provide facilities in a central office to supply information on the effects of treatment in Australia.

The purpose of this meeting is to decide whether it will implement the decision of both the New South Wales Committee of the Royal College of Obstetricians and Gynaecologists and the Regional Council to put into opera-

tion forthwith this project for the standard registration of all genital cancer occurring in the Commonwealth, by uniform method which will not vary from State to State, like the railway system, but will start off on a similar plan, so that it will be a simple matter to tabulate the results and submit them to the same system of machine sorting. In other words, the meeting will decide whether there is to be a registry or whether there is not to be a registry, as I think that it will be agreed that it will be difficult basically to alter the system that has been worked out and submitted this evening.

Let us look at the situation that prevails today in Australia. Many hospitals have excellent methods of vital statistics and excellent follow-up clinics relating to genital cancer, but a great many hospitals have no such system at all. Even the best of these hospitals depend on a history taken by a junior of the medical profession in which to insert the statistics and data which must stand for all time. If there is to be a registry at all, it can exist only on absolutely correct information. It is better to have no registration at all than to have one founded on faulty data or on information that is at best vague. I do not believe from my investigation of histories in many hospitals that the system that prevails is adequate for anything else except the name and age, sex, date of admission to hospital and discharge from hospital, and possibly the details of operation. Beyond that it is very difficult to be sure that in many hospitals the information collected on

¹ Read at a meeting of the New South Wales Committee of the Royal College of Obstetricians and Gynaecologists on May 25, 1955.

the history sheet is as uniform and accurate as a registry demands. Therefore, one of the first principles that had to be established when the idea of this registry was conceived was to provide a basic pro-forma that would provide the least possibility of inaccurate information. To do this it was found necessary to have fixed answers, and indeed this is the basis of the whole registry.

Let us look at other forms of registries that obtain in other States, in other hospitals, and in other parts of the world. These all depend on an abstract card. On that abstract card there are the patient's name, age, sex and occupation, the date of the first symptom, the site of the disease, the evidence of local spread and regional metastases, the treatment, the pathological report, the final diagnosis, and a space for follow-up data. The rest of the information that may be required by any research worker

objective worth striving for, despite the labour involved. Admittedly it means additional organization and work at different hospitals; but, after all, that is constantly happening in hospitals—departments are being enlarged and tremendous amounts of money are spent on providing comforts for patients. Moreover, the amount of money and time that would be spent on such a vital aspect of the cancer problem as this would be infinitesimal when compared with what has gone before on projects that have produced nothing. I think that it is time that we as clinicians turned to the clinical investigation of genital cancer and really did attempt to investigate and follow up such patients, with the emphasis on the disease and its possible aetiological associations.

This meeting can do several things: it can accept the principle of a registry; it can disagree with the principle of a registry and leave things as they are; it can decide that a registry should be formed, but that some definite modifications should take place in the system; or it can agree to every detail that I have outlined and determine to help in a pilot survey to last over the next six months, in order to see how the system will work.

If the last-mentioned decision is taken, the survey can be carried out successfully if everyone is prepared to help, because the peripheral cooperation is more essential to the success of this project than the efficiency and discipline at the central registry. In other words, it is useless to give this project lip service and not be prepared to spend extra time in establishing the system at your hospital and filling in the case history for your own private patients. This is something that the College can and will organize only if members are prepared really to assist and support it in every way. Often in the past approval has been given to this scheme at meetings, but the project has broken down because it was thought to be too big and very difficult, and it will be only by an effort on our part that we can throw any light on the varying facets of this disease. The history sheet has been redesigned many times, and I know that this is not the last time. It will still be modified and almost certainly grow larger. In the past it has been the usual criticism

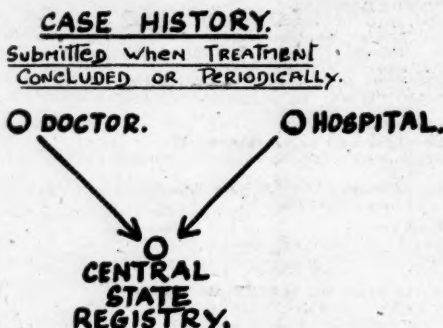


FIGURE I.

about that patient must lead him back to the history written by a junior member of the medical profession, lying long forgotten on dusty shelves in the records room of some hospital. To me, this seems a very inadequate method of conducting a special survey of the sort we have in mind. If we are to have a registry, I think that the only question we have to decide this evening is whether we shall still carry on with this and depend upon the old method of hospital history-taking, or whether we shall provide our own history form, worked out with a great amount of patience and thought, and probably still very inadequate, but at least approaching more closely towards accurate information than any other previous method attempted. The other basic documents that I wish to speak about tonight, necessary for the administration of such a project, are just standard documents that must be used in any attempt at registration. They are the admission and discharge sheet which is required by each hospital or doctor submitting cases, the registration card and the follow-up card, and later I will show you how these are expected to work. But I do wish to make this one point and drive it home—the necessity for correct information to be obtained at the source if this registry is to perform the function that I hope it will.

Only recently we have seen articles relating to the incidence of cancer stating, for instance, that the one time-honoured statement which we all accept—that the incidence of cervical cancer increases with parity—is not accurate. We find great variations in the incidence of cancer according to race; we find variations of cancer in association with penile hygiene. We find it stated that cancer of the cervix occurs mainly in those who have some pre-existing pathological cervical condition. It is also said that cancer of the body of the uterus occurs in association with fibroid tumours and diabetes. Someone else feels sure that the oestrogens and hormonal activities are all-important, and so it goes on; and the only way in which the College could test so many of these statements would be to collect a large amount of statistics on these subjects. We could easily get at these by machine-sorting and obtain our answer very quickly over a mass of material which would embrace the Commonwealth. I think that this is an

REGISTRATION CARDS.

SUBMITTED IMMEDIATELY.



FIGURE II.

that this is unnecessarily long, and it is undoubtedly your criticism at the present time; but every time an individual or a committee sets out to study it and streamline it, it ends up two or three pages longer. I have not the slightest doubt that anyone going through it now will find notable omissions that should be rectified, and at the same time will find very little that he can really delete without the project losing something. The pro-forma has been divided into different sections, to provide fixed and free answers. It has an index in the front of it showing what it is all about, and the pages on which the varying sections will be found. I will ask Dr. Ewan Sussman, who is assistant registrar at the present time, to explain some of the pro-forma later on, and also to deal in some detail with the follow-up investigation and the system to be employed.

The pro-forma has been designed also to operate and act as a history sheet which will replace the history sheets throughout the hospitals for genital cancer. There have been many criticisms about this in the past—that it takes too long to fill in, that it is unwieldy, that unnecessary information is required, and so on—but I will ask Dr. W. G. McBride, the superintendent of the Women's Hospital, Crown Street, to speak on this subject in a few minutes. He will tell you his experience of the time taken in filling this in, and compare its value with that of previous histories. Let me say now that the pro-forma by common consent has been finalized; it is being put onto better paper, printing in many places can be on both sides, and its total bulk should then be reduced by half.

I will now discuss the administration of this system. Each hospital or private doctor for each case of genital

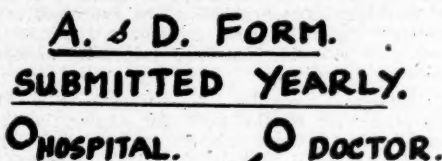


FIGURE III.

cancer will fill in a pro-forma, a registration card, and a follow-up card, or preferably he should fill in two pro-formas, a separate follow-up card and a registration card. The registration card is submitted to the registry quickly, and there it is filed in alphabetical order and retained in that order permanently. Later, the case record or pro-forma is submitted to the Central Genital Cancer Registry, when the doctor or hospital has finished treatment. The pro-forma is then given a number in sequence and filed away permanently, and the number that it is given is stamped on the registration card. This means that on the registration card there is a hospital registration number, a tumour registry number, and the name of the patient. In this way a cross-index system is provided, whereby the pro-forma may be obtained by name, by registry number or by hospital registration number. As soon as the pro-forma is filled in, the hospital or doctor keeps an admission and discharge sheet on which the registration number of the patient is placed, these starting from "1" commencing each year. The A and D forms are submitted, or copies of the A and D forms are submitted to the central registry every year or every six months. That will be decided later by investigation. So much for the pro-forma.

The registration card I have explained, and the A and D form is kept at the hospital and a copy is submitted to the central registry each year, the follow-up card is kept by the hospital or doctor if this is desired, and a separate follow-up card is made out at the central registry for each patient in order that there may be a check-up on any follow-up sheets that do not come; or else if the doctor or hospital does not wish to follow up the patient, the card may be sent to the central registry for that purpose. When the pro-forma reaches the central registry the information on the fixed answers is extracted from it onto the punch cards. The punching can be done in the central registry on a hand machine, with little experience. If not, the punching can be done by an analytical firm that exists in every big city. But this should not be too big a job to be done in each central registry, with a machine that costs, I believe, about £90.

Once the card has been stamped, a copy is made for each central registry, so that the central registry, on any given day, should have a complete, current, up-to-date number of cards for the whole of Australia. Thus research

into the statistical clinical associations of genital cancer can quickly be conducted, and much new information throwing further light on this disease will be more readily available.

In this way, after a very short time, with the enormous amount of information that should come in, properly tabulated, it ought to be possible by a request to the central registry in a very short space of time to find out the answer to any sample problem. Such an inquiry into the

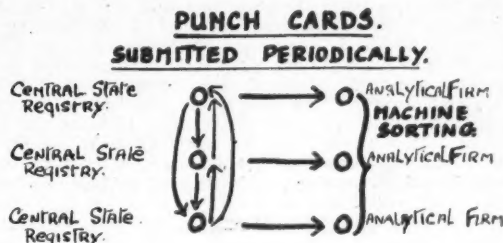


FIGURE IV.

number of women of Jewish descent, who have lived in northern Australia, who have had three children, who are in the middle-income group, who have had pain and bleeding and swelling for three months and vaginal discharge for two months, and who have contracted cancer of the cervix can quickly be made by machine sorting. The relation of this group to a similar one of different racial origin could then be tested. There are any number of possible combinations of clinical and pathological findings that can be associated in this way. The master card gives the operator the information as to which is the appropriate button to press, the cards fall out, and the answer is correctly given; then those cards that come out can be resubmitted to any finer analysis that the research worker may require.

The personnel that are required at any hospital to supervise the medical records section should be: (i) a senior member of the clerical staff, who is responsible for filling in the A and D form each day, and writing out the registration card and sending it to the central registry; (ii) a member of the honorary medical staff, who will superintend the clerical section and who will be responsible for filling in the pro-formas.

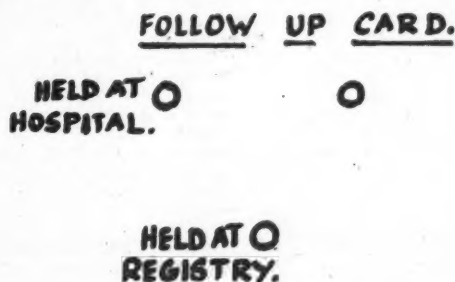


FIGURE V.

Each hospital will need, if possible, to establish a follow-up clinic, in order to provide the information that is required by the central registry, although it will be possible when necessary for patients to be followed up clinically at the central registry.

It is only by carrying out such a uniform system throughout the whole of the Commonwealth that we shall avoid the danger of selection of cases. When such an experiment is conducted on a State basis, it misses out vital factors that vary according to geographic and local

conditions and to climatic and dietetic factors that may be very important later.

At the central registry there will be a chief registrar and one or more assistant registrars, and a permanent lay secretary, who will superintend every pro-forma that comes in and be responsible for the maintenance of the registration cards, the basic documents and the pro-forma, and who will be responsible for making sure that each case is put onto a punch card. It is necessary to have a permanent clerical assistant—somebody who will always be available to answer the telephone, and who will be able to carry out the routine requirements of the registry at any time. It will be necessary, with the follow-up card, to mark in ahead when the patient is next required to be examined, and to be prepared each month to check a few days ahead to make sure that information comes in from clinics and individual doctors informing them of the progress of each patient. The lay secretary must be able to make continual contact with hospitals and to check with a member of the senior administrative staff at her own level.

The number of cases that would be expected to be handled each year, I think, would be in the vicinity of one thousand. Naturally, this number would take a long while to develop, but there would be one or two cases per week from the bigger hospitals and many less from the smaller ones, and individual doctors would have only odd case records to fill in every now and again. It would seem that it would not be a very arduous problem for either hospital or doctor to cooperate fully in this project, which can promise so much.

Naturally, the more information, the better; but it is better to have some information than none at all, which is the position at the present time. I therefore commend to you that tonight this meeting fully and unanimously supports not only the principle, but also the detailed operation of this project. I will ask Dr. Ewan Sussman and, later, Dr. W. G. McBride to speak in order to elucidate problems from the point of view of the central registry and the follow-up, and of the routine and detail necessary at the peripheral or referring centre.

Acknowledgements.

I wish to express my gratitude for the assistance afforded me by the staff of the Victorian Anti-Cancer Council in allowing me to study their procedure. I wish to thank Miss B. Toynton and Mr. George Anderson, of the Anderson Analysis, for their unfailing assistance in the project over the last five years. I wish also to thank the Mother Rectress for providing accommodation at Saint Vincent's Hospital, Sydney, for the Central Genital Cancer Registry. Thanks are also due to Professor E. Ford, of the School of Public Health and Tropical Medicine, for his invaluable assistance and advice in the launching of this project, and to Dr. H. O. Lancaster, also of the School of Public Health and Tropical Medicine, for checking the validity of the scheme and giving advice. Finally, I am also greatly indebted to an anonymous donor, who has provided funds to enable this project to be launched in Australia.

UNSATISFACTORY RESULTS AFTER CHOLECYSTECTOMY.¹

By S. H. LOVELL,
Sydney.

The purpose of this paper is to stimulate consideration of the unsatisfactory results which sometimes follow cholecystectomy in the long-term sense, since a colleague, Dr. J. M. Yeates, has covered the subject in so far as the operation itself and the early post-operative period are concerned.

¹ Read at a meeting of the Section of Surgery, Australasian Medical Congress (British Medical Association), Ninth Session, Sydney, August 20 to 27, 1955.

It is appropriate to discuss gall-bladder disease in some detail because of its comparative frequency in this country, where it is probably the commonest cause of organic dyspepsia. The operation of cholecystectomy is a common one, both in the larger centres and in general practice. Morbidity and mortality rates are very low, and it is not common for consultants to be called in to see "a gall-bladder which has gone wrong". Strictures of the common bile duct do not appear to be as frequent as in some other countries.

But those who would remove the gall-bladder must be ever watchful if the number of unsatisfactory late results is to be kept low, and the thesis to be presented is that the most important factor is the careful selection of patients for operation.

It is generally believed that unsatisfactory results are more common in patients who appear unlikely to present any technical difficulty at operation—or, expressed in terms of symptoms, patients whose presenting symptoms have not been real pain, but flatulent dyspepsia, nausea and biliousness or migraine.

Many surgeons recognize the pointers to a difficult cholecystectomy or to the need for exploration of the common bile duct. These pointers include the following: (i) severe attacks of pain in the right hypochondrium, lasting for a few days, and requiring powerful sedatives; (ii) severe pain in the mid-line and small of the back suggesting an associated pancreatitis; (iii) unexplained cachexia; (iv) jaundice.

Reference has been made to these pointers deliberately, firstly because they are also features commonly associated with the more severe forms of gall-bladder disease, and secondly to emphasize the observation that, as is so often the case in other fields of surgical endeavour, the worse the disease the better the result. It is commonly found, with obvious reservations, that the more a patient's condition demands an operation, the better will be the result.

The more one looks back over one's own series of cholecystectomies, the more one is impressed by the rarity of unsatisfactory results when the operation has been performed for an advanced grade of disease, and by their frequency when the decision to operate has been a borderline one, or when minimal disease has been found at operation.

The most common type of unsatisfactory result is the so-called post-cholecystectomy syndrome, and it is believed that the principal cause of this unhappy result is an error of judgement—an error in the selection of patients for operation—rather than an error of operative technique. This impression is recorded clearly and without reservation, since it influences one's approach as a consultant to the unfortunate patient.

The corollary to this thesis is that time spent in a careful assessment before operation is not time wasted, because whatever difficulties arise while a surgeon is considering the problem carefully, these are negligible when compared with the difficulties of the post-cholecystectomy syndrome.

The observations made in this paper are based on a personal series of patients with gall-bladder disease, together with a close association with a larger series. Consequently it is felt that the impressions have been acquired in the hard way, and have not been coloured by enthusiasm stimulated by the prolific literature on this subject.

In practice unsatisfactory results can be classified in the following two groups: (i) the so-called post-cholecystectomy syndrome; (ii) some other form of unsatisfactory result.

Since the former group is the larger and the more important, it should receive the greater emphasis in this discussion.

The Post-Cholecystectomy Syndrome.

The literature abounds with many explanations for the post-cholecystectomy syndrome, and with an equally large

number of operative and therapeutic measures to cure it. Surely this in itself means either that the actual cause is unknown, or that there is more than one cause, and the latter is the more likely.

Few problems cause the consultant more concern, since a decision to operate again cannot be made easily, information about the initial operation may be vague or even misleading (though given in all good faith), and any such secondary operation must involve a major exploration, with the realization that a negative finding and a persistence of symptoms may result in the unfortunate patient's being branded a neurotic.

To make the position clear for purposes of later discussion, it is recorded that one's experience leads to the following beliefs.

Firstly, the post-cholecystectomy syndrome is more common when cholecystectomy has been performed, but gallstones have not been found. Such operations are those performed for chronic cholecystitis, biliary dyskinesia, flatulent dyspepsia with a positive response to Graham's test, and recurring biliary colic with a negative response to Graham's test. While it has been the happy experience of surgeons to have a number of successful results in this group, it is equally true that they have had a number of disappointing results. Experience may be a hard teacher, but the lesson is that, since patients with these symptoms are not in an "urgent" category, their problem should not be decided in a hasty manner. They should be subjected to careful review and assessment, and it is not unreasonable to discuss the possibilities with the patient and a close relative, because it cannot be repeated too often that it is an accepted belief that cholecystectomy for non-calculous cholecystitis *et cetera* is followed by disappointing results in 65% of cases.

The second belief is that a number of patients who initially appear clinically or on radiological grounds to be suffering from gall-bladder disease, would, on more prolonged assessment, and after further investigation, be found to be suffering from some other lesion, such as peptic ulcer, hypertrophic gastritis, hiatus hernia, chronic hepatitis, coronary disease, renal or colonic disease, or even appendicitis.

Sometimes gall-bladder disease and one of these other lesions may coexist, and prolonged consideration will be required before the decision is made to remove the gall-bladder. Here again, it is stressed that time spent in a careful assessment is not time wasted. The good patient with genuine symptoms is usually appreciative of a careful approach to what is still a major operation, and the end result is usually happier.

Having recorded these two beliefs, one gives emphasis to a statement made previously—that the principal factor in the syndrome is the faulty selection of patients for operation.

The third belief is that the most common finding at laparotomy for this syndrome is dense adhesion of the pyloro-duodenal segment to the region of the gall-bladder fossa. The literature appears to make little reference to this, and maybe one's experience has been misleading; but it is believed that other surgeons in this city have had a similar experience. For what it is worth, it is always one's practice to separate these adhesions carefully, to secure as complete haemostasis as possible, and subsequently to place some omentum between the pyloro-duodenal segment and the liver. Admittedly it is difficult to explain any relationship between such adhesions and the syndrome, but it is thought that the routine insertion of omentum in this manner at cholecystectomy may reduce the number of unsatisfactory results. It was fashionable to suture the falciform ligament to the gall-bladder fossa, but this is not recommended, as on two occasions it has been found to be the cause of pyloro-duodenal obstruction.

The fourth belief is that in spite of all this, when the surgeon is led on to operate in the hope that he will find a residual stone in the common bile duct, he rarely finds one. Although one has removed a stone from the common bile duct twenty-four years, twenty-two years, and fifteen

years after cholecystectomy for calculous cholecystitis, cases like these have been the exception. In passing, it is interesting to record that two of these patients had never been jaundiced, and the third had had only transient jaundice on one occasion. The infrequency of jaundice in connexion with the post-cholecystectomy syndrome is striking, and it is believed that the surgeon who remembers and recognizes Charcot's hepatic intermittent fever will diagnose the residual choledocholithiasis rather than the one who waits for jaundice or depends on intravenous choledochograms.

Reverting to the case in which the decision to operate has been erroneous, it is admittedly difficult to explain the symptoms. Food allergy, constitutional inferiority, psychosomatic problems and dietary malpractice have all been blamed, but none of these conditions is improved by operation, and careful examination, investigation and review are essential to detect suggestive evidence.

Apart from these instances of erroneous judgement, and a lesser group in which an incorrect diagnosis has been made, there is a still lesser group in which some other cause for this syndrome will be found. Such causes include residual stone in the common bile duct; residual remnant of the gall-bladder, or bulbous cystic duct, with or without a calculus; stricture of the common bile duct or of the hepatic duct; chronic inflammation of the common bile duct; neuroma of the cystic duct stump; stricture of the ampulla of Vater; undue patency of the ampulla with reflux; chronic pancreatitis and retained foreign bodies such as portions of tubes. It should also be remembered that the gall-bladder may still be present in spite of the patient's belief that it has previously been removed, and careful interrogation in respect of the post-operative period may provide evidence that the previous operation has been a cholecystostomy and not a cholecystectomy. It is also appreciated that when pancreatitis has been associated with gall-bladder disease, the pancreatic lesion may not subside for some time.

However, while such causes as have just been enumerated are found on occasions and are logical explanations for the syndrome, it is believed that the surgeon who expects to find them common is doomed to bitter disappointment.

Management of the Post-Cholecystectomy Syndrome.

When a patient presents with the post-cholecystectomy syndrome, his problem calls for a detailed assessment. The findings at the previous operation should be ascertained if possible, it being remembered that the recorder's impressions are not necessarily facts. Clinical examination must be thorough, and the other systems must be investigated with the use of such ancillary aids to diagnosis as are indicated by the findings. A provisional opinion is then formed, and the patient should be given some placebo and brought back for further review, possibly on more than one occasion.

Prior to operation, valuable assistance may be obtained on occasions by intravenous choledochography; but the results must be interpreted with caution, and alarming anaphylactic reactions have occurred. In one case in this personal series, death probably would have resulted had not the incident occurred in a large and fully equipped hospital. This method of examination holds great promise, and with further improvement it should be a most useful aid to diagnosis; but as yet it should be used with caution and the results accepted with reservation.

If the surgeon is impressed by the constant nature of the symptoms and findings, and if no other cause has been ascertained, he may make a decision that exploratory laparotomy is justified. It is believed that a frank discussion with the patient is a wise step at this juncture, and the surgeon should promise to undertake a thorough search (rather than promise "findings"), since it is surprising how many patients appear to carry on happily when they are told that their organs are healthy and that there is no sign of cancer.

When exploratory laparotomy is undertaken it should include a full examination to discover any definite patho-

logical entity, with careful separation of adhesions and, with few exceptions, a thorough exploration of the common bile duct. Subsequently, it is suggested that some omentum should be placed between the pyloro-duodenal segment and the inferior surface of the liver.

Some surgeons advocate operative cholangiography as an aid to the satisfactory clearance of the common bile duct. The use of such a measure is necessarily limited to certain centres where special provision can be made, and it is not unfair to comment that the value of operative cholangiography is doubtful. Most surgeons have their own particular method of exploring the common duct, and it is better to depend on one's own judgement and experience.

In a limited group of patients relief may follow vagotomy, and in others the exhibition of "Pro-Banthine" will be helpful. Some have obtained relief from preparations of pancreas and others from luteal hormones or histamine desensitization. However, there will remain a group in which the surgeon can only admit failure as gracefully as possible and regret an erroneous decision to operate.

Some Other Types of Unsatisfactory Results.

It is not intended to make any extensive reference to other types of unsatisfactory results, and only a few instances will be given, since the former syndrome is the important one, and to it our greatest concern should be directed.

Incisional hernia is an occasional end-result, but its frequency is less in recent times. Since the introduction of chemotherapy there has been an appreciable reduction in major sepsis and post-operative chest complications. The use of a separate stab incision for the drainage tube is also a factor in the reduction of its frequency. Even with the blessings of chemotherapy, good surgical technique is still essential if the incidence of herniation is to be kept at the lowest possible level.

A persistently painful back may follow the use of excessive elevation by a gall-bladder support of a patient who already has some osteoarthritis of the spine. The surgeon should note carefully any evidence of osteoarthritis in the cholecystogram, and use a minimum of elevation in such cases.

Post-operative stricture of the common bile or hepatic duct has already been mentioned, and it is usually manifest in early convalescence or during the first year after operation. However, it may develop slowly, and in one case in this series it did not become manifest until four and a half years after the operation. It is generally accepted that the most common cause of such strictures is inadvertent trauma, particularly in technically easy cholecystectomies.

Occasionally a stricture may be the end result of a small leakage of bile or blood with low-grade infection. Much controversy is attached to the use of tubes for common duct drainage, and while it is not desired to stimulate this controversy, it must be recorded that experimental evidence confirms the impression that prolonged drainage by means of rubber tubes may cause chronic inflammation and stricture formation. On a few occasions, peculiar non-malignant strictures have been found in the hepatic duct, well beyond any area of operative trauma. It is difficult to explain the aetiology of such lesions. In this series two have been found in recent months, and in both cases the original operation had been performed by surgeons of high repute and the common duct had not been opened. A similar stricture was found in a patient late last year during a laparotomy for obstructive jaundice. This patient had no previous operation, and the common duct did not contain any stones. These strictures have been a most intriguing problem.

Recently a chronic subphrenic abscess was drained some four years after cholecystectomy. The history indicated that the patient had had a stormy convalescence. Antibiotics had been administered in large doses, and over the intervening period each outburst of activity had been

quelled with further doses of these drugs. The possibility of such chronic abscesses persisting is increased by the intensive use of antibiotics. It is not advisable—and it might be erroneous—to fire an antibiotic broadside when a patient develops a complication the nature of which is not understood.

On another occasion a massive extraperitoneal haematoma was evacuated one year after the operation. An artery had been damaged by the surgeon while making the stab incision for the drainage tube. If much bleeding is encountered when such an incision is made, it is a wise precaution to insert a narrow gauze pack alongside the tube, as this will nearly always control such bleeding.

Summary.

Reference has been made to some of the unsatisfactory results which may follow the operation of cholecystectomy, and particular emphasis has been directed to the so-called post-cholecystectomy syndrome.

The belief is stated that the most common reason for the frequency of this syndrome is the faulty selection of patients for operation—an error of judgement and not an error of technique.

The proportion of cases in which some definite pathological entity is found at a subsequent laparotomy is believed to be less than anticipated, and in this series the most common finding has been dense adhesion of the pyloro-duodenal segment to the region of the gall-bladder fossa. However, it is admitted that it is difficult to correlate such pathological findings with the symptoms.

Emphasis has been laid on the need for a very careful assessment before performing laparotomy for the post-cholecystectomy syndrome.

Brief reference has also been made to certain other less common types of unsatisfactory results.

THE HAZARDS AFTER CHOLECYSTECTOMY, WITH REVIEW OF 500 CASE RECORDS.¹

By JAMES MACRAE YEATES,
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THE sudden death of a patient on the day following cholecystectomy prompted me to examine the incidence and causes of such deaths. This led to an inquiry into all the hazards likely to beset patients after this operation.

For this purpose a survey was made of the case records of 500 consecutive cholecystectomies performed at Sydney Hospital during the years 1949 to 1954. These were all operations of election. Of the 500 patients, 110 were men and 390 women. It is usually thought that women are far more commonly affected than men, so that this ratio of about 1:4 suggests that men are making up some leeway. The average age was forty-eight years (men forty-nine, women forty-eight). There were 23 women under the age of twenty-five years, the youngest being aged fifteen years, and nine aged seventy years or more, the eldest being seventy-five. There were only two men aged under thirty years (twenty-six and twenty-eight) and one aged over seventy years (seventy-two). There is a suggestion here that women are tending to suffer from gall-stones at an earlier age.

Stones were found in the gall-bladder in at least 423 cases (85.2%).

As it is generally agreed that cholecystectomy is better avoided for stoneless cholecystitis, this figure is rather lower than is desirable. The common bile duct was explored in 51 cases (10.2%). This also is a low figure, indicating a reluctance to assault this structure, and suggests that we are missing a few lurking stones.

The methods of dealing with the common duct after exploration are of interest, and can be summarized as

¹ Read at a meeting of the Section of Surgery, Australasian Medical Congress (British Medical Association), Ninth Session, Sydney, August 20 to 27, 1955.

follows: drainage by catheter, 17 cases; drainage by T-tube, eight; suture, 19; anastomosis to duodenum, six; indefinite, one case.

Drainage is usually considered the safest procedure, but in this series only one death followed suture, and in this case a fine tube was passed via the cystic duct stump. Edwards and Herrington (1953) have shown that provided a meticulous two-layer technique is adopted, suture of the common duct may be safely performed in cases in which no obstruction remains. Of their series of 51 cases of duct exploration, primary closure was adopted in 41.

Lateral anastomosis to the duodenum was employed (almost exclusively by one surgeon) when rigidity of the lower part of the duct prevented really satisfactory dilatation. The immediate results of this operation were excellent, convalescence being rapid and uneventful except for a temporary discharge of bile via the drainage tube in a few cases. It is noteworthy that in this series the T-tube has by no means superseded the simple catheter for duct drainage.

Stones were found in the common duct in 23 cases (4.6%), and in each instance there were also stones in the corresponding gall-bladder. This is a low figure, which seems to confirm the impression that some stones are being left.

The duodenum was opened only twice for the purpose of clearing up doubt as to the state of affairs in the lower reaches of the common duct.

On numerous occasions exploration was attempted via the cystic duct, but only once were stones found in this way. On one occasion no stones were found when this approach was used, whereupon the common duct was opened and eight stones were removed. As explorations so conducted are clearly half-hearted (save in exceptional cases), they have not been included in the total given above.

Post-Operative Complications.

Chest Complications.

Minor chest troubles were very common, but the great majority rapidly cleared in a few days. There were only eight serious cases, mostly associated with pulmonary collapse. Bronchoscopy on the first day gave dramatic relief in one case and considerable relief on the eighth day in another case. In the only very serious case there was a long history of chronic bronchitis and asthma, and the patient was in hospital for thirty-eight days with collapse of the lower lobe of the left lung. That no deaths and no permanent morbidity appeared due to chest complications is a tribute to the relaxant drugs and to the anaesthetists who gave them.

Pulmonary Embolism.

No deaths occurred from pulmonary embolism, that much-feared catastrophe, and only once was its presence suspected seriously, subsequent events proving that the cause of the trouble was in the wound.

Cholecystectomy is usually considered one of the operations rather prone to cause pulmonary embolism, so that its absence in 500 cases is remarkable and may partly be due to the enthusiasm of the physiotherapists for early movement and breathing exercises.

Venous Thrombosis.

Venous thrombosis was diagnosed five times, but only once did the diagnosis seem well established. Anti-coagulants were given in four cases, and the impression is gained that there is a tendency (possibly laudable) to give these potent drugs on the slightest suspicion. There is abundant evidence that the resident medical staff is acutely aware of the threat of thrombosis and of the need for its immediate treatment. This attitude may be partly responsible for the absence of pulmonary embolism. As there was no untoward bleeding after the use of anti-coagulants, it would seem that these drugs were given with discretion.

Hæmorrhage.

In 10 cases bleeding occurred in the wound itself. In some of these the blood was merely a nuisance, but in others it delayed convalescence. In at least three cases (and probably more) there was undue bleeding from the gall-bladder bed. "Oxycel" was used in these cases, but its value was not striking. It is clear that we should be even more scrupulous in our efforts to obtain absolute hæmostasis, for which there is no modern substitute.

Excessive Bile Drainage.

Excessive drainage of bile occurred three times after cholecystectomy (for seven, seventeen and forty-one days) and twice after duct exploration and suture (thirty and seventy-six days). The fact that there were two such serious leakages in a total of 19 ducts sutured indicates that the method is not foolproof in our hands.

TABLE I.

Mortality Rates at Sydney Hospital Compared with Those from the Mayo Clinic (1952).

Procedure.	Hospital.	Operations.	Deaths
Cholecystectomy	Sydney Hospital.	449	5 (1.1%)
	Mayo Clinic.	1129	9 (0.8%)
Choledocholithotomy	Sydney Hospital.	22	4 (18.2%) ¹
	Mayo Clinic.	184	6 (3.3%)
Choledochostomy	Sydney Hospital.	28	0
	Mayo Clinic.	253	2 (0.8)

¹ It is realized that the figures for the combined operation are really too low for the statistician's approval.

Wound Infection.

For the purposes of this paper infection was considered to have existed when there was a discharge from the wound sufficient to detain the patient in hospital beyond the fourteenth post-operative day. There were 21 such cases. No suture material appeared exempt, and none particularly culpable, although continuous nylon sutures seem under suspicion. In some cases the infection was serious and delayed the discharge of the patient from hospital for many weeks. An outstanding feature was the confusion in diagnosis caused by unsuspected wound infection. There was a most surprising and regrettable tendency to look to the wound last, or not at all, as the cause of unexplained pyrexia or tachycardia.

One patient was suspected of having thrombosis and was given heparin. A hæmatoma was found in the wound later. Another patient, whose wound was closed with continuous nylon sutures, was diagnosed as possibly suffering from fibrillation on the strength of his tachycardia. A third patient was treated as suffering from a urinary infection, without the formality of urine examination. In these three, and in other cases, relief of all symptoms followed the subsequent correct management of the infected wound.

Burst Abdomen.

There were four cases of burst abdomen, the rupture occurring on the fifth, seventh, tenth and twelfth days respectively. In one case a continuous nylon suture had broken, and in another there had been excessive coughing. In no case was there any real evidence of infection. Suture materials varied. Tweedie and Long (1954) reported 15 cases of wound disruption in 2738 operations on the biliary tract (0.55%). This figure is rather better than the 0.8% of our series, so that improvement is possible. It is remarkable that recovery seems to be the rule after such a devastating complication. Our four patients rapidly recovered after closure of the wound with interrupted nylon sutures.

Deaths.

The deaths will be discussed under two headings: (i) those following the combined operation (gall-bladder removal and duct exploration), (ii) those following cholecystectomy only.

(i) Five deaths followed the combined procedure. Jaundice was present in three of these cases. A cause for obstruction of the common duct was found in every case (stones in four cases, carcinoma in one), but was completely removed in only one case (stone). No deaths occurred in 28 cases in which exploration had been fruitless. This confirms the findings of many others that deaths are due not to the operation, but to the operation conducted in the presence of stones *et cetera*, particularly when the latter are not all removed. Any assault on the common duct must clearly be determined and complete, and there must be no compunction in opening the duodenum when a doubt exists.

Of these five deaths, three were due to leakage of blood or bile or both, two of the latter having residual stones.

(ii) There were also five deaths after cholecystectomy, a mortality rate of 1.1% (five in 449 cases). This figure compares favourably with those of some of the larger clinics overseas (for example, that at the Mayo Clinic in 1952 was 0.8%) and appears to approach an irreducible minimum. But critical inspection of the causes of death shows that most, if not all, of these might have been prevented. All five deaths were in fact due to a lethal pool of blood, bile or pus. When the three deaths from similar causes in the combined operation group are included, the total number of deaths associated with intraperitoneal collections is eight. A striking feature is that in nearly every case the cause of mischief was looked for in other places than the operation area. As the onset of symptoms is often surprisingly sudden and accompanied by collapse, there is almost a compulsion to diagnose occlusion, be it coronary or pulmonary. Time is then wasted on such investigations as electrocardiograms and X-ray examinations of the chest. There is a real danger that anticoagulants will be given and aggravate the actual cause of the collapse. Cases which present in less dramatic fashion tend to be labelled hepato-renal syndrome, cholangitis, pancreatitis *et cetera*.

One of the most surprising and disturbing findings is that death may follow even quite small collections—for example, 10 to 15 ounces. With such a small lethal dose it is natural that the local physical signs are simply non-existent. The diagnosis must be made on the history.

There is a very human tendency for a surgeon to prefer the cause of the mischief to be found as far as possible from the site of his own handiwork. A sedulous search is usually rewarded, be it by a fine crepitation at the base of a lung or an even finer aberration of the cardiogram. The cold facts of this series show that we must pocket our surgical pride and be prepared to look first to the operation area for the cause of mysterious "occlusions". Operation within a few hours, before irreversible changes occur, is the only treatment likely to save these patients. There is an evident need for a more positive attitude in this respect. Such prompt action was taken only once in this series, after a sudden severe collapse about twenty-four hours after operation. Immediate recovery followed the aspiration of a pool of bile. It is worthy of mention that on several occasions patients suffered some degree of collapse immediately on return to their beds. These responded promptly to resuscitation. The time for grave concern comes when the improvement is not maintained. The main danger period for leakage appears to be from the fourth hour to the fourth or fifth day. It would take a mighty volume to describe the efforts made in vain to save the lives of these patients—the zeal shown in the use of the most modern agents, such as cortisone and noradrenaline, and the finesse displayed in the choice of just the right electrolyte.

There is more than a suspicion that the torrent of new and potent drugs has beguiled us into treating effects superbly and causes not at all.

In this series of 500 operations there were 67 complications (including the 10 deaths). Fifty-one of these had their origin in the operation area. In other words, 75% of all complications were directly due to the injury inflicted by the surgeon. In the light of these figures it is suggested that when a patient ceases to thrive after a cholecystectomy the dressing should be removed and the wound treated on its merits. Such an obvious precaution seems in danger of being forgotten in the rush to try the latest new-fangled drug.

Comment.

We have seen in this brief survey that even in a teaching hospital errors both of technique and of judgement are apt to mar that perfection for which we all strive. It is conceivable that similar lapses may occur at other hospitals. I hope that this frank exposure of our peccadilloes may help to prevent repeat performances.

In conclusion I should like to sheet home a little of the blame to the public and even to the local doctor. For this analysis has shown that the vintage gall-bladder, fibrotic and well-entrenched in the liver, resents being dislodged. It has shown that when stones, bored after dull years in the gall-bladder, seek the gay life in the common duct, the mortality rate of operation rises from 1.1% to the alarming level of 18.2% (although at the Mayo Clinic the rate is merely quadrupled). Again, although the average age of the 500 patients was forty-eight years, the average of the 10 who died was sixty-three years.

These facts underline the danger in delay. The enlightened patient and his doctor will therefore realize that once gall-stones are discovered, their early removal is mandatory. As we are still awaiting that mythical potion that will dissolve stones, gall or otherwise, operation remains the treatment of choice, despite some of the unkind remarks made in this paper.

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MYCOTIC INFECTIONS OF THE SCALP: MYCOLOGY¹

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THE dermatophytes, the fungi causing chronic infections of the hair, skin and nails, have been known to medical science for a little over a hundred years. They were the first of the pathogenic fungi to be described; recognition of the fungi causing systemic mycoses came much later. Almost all the fungi pathogenic to man and animals belong to the class of Fungi Imperfecti, so-called because their life cycle is incomplete, or at least incompletely known.

¹ Read at a meeting of the Section of Dermatology with the Section of Pathology, Bacteriology, Biochemistry and Forensic Medicine, Australasian Medical Congress (British Medical Association), Ninth Session, Sydney, August 20 to 27, 1955. Some of the work referred to in this paper was done with the aid of a grant from the National Health and Medical Research Council of Australia.

They appear only in vegetative forms and do not show the sexual stages which are found in the higher fungi and in plants, and by which these latter are classified. Table I shows the place of the Fungi Imperfecti in the plant kingdom. The class of Fungi Imperfecti or Deuteromycetes includes a vast number of saprophytes, most of which are soil fungi, as well as the few genera which cause human or animal disease.

Three principal genera of fungi causing ringworm of the scalp were known by 1845, and named *Microsporum*, *Trichophyton* and *Achorion*. Under each of these genera, species were placed according to the clinical characteristics of the lesion from which they were isolated, the gross appearance of the fungus in culture, or the name of the discoverer. This method of classification gradually resulted in hopeless confusion, since it permitted identical fungi to be placed in different genera according to whether they had been isolated from hair, skin or nails, and different fungi to be placed in the same class irrespective of their cultural characteristics. Most of the dermatophytes have a large and bewildering number of synonyms. The publication of Sabouraud's book "*Les teignes*" (1910) helped to place the subject of medical mycology on a sound and practical basis; but a great deal of confusion still exists and is only gradually being cleared up. The classification of the dermatophytes has been simplified by a study of cultures and their microscopic features. Emmons (1934) showed that only three genera need to be considered—namely, *Microsporum*, *Trichophyton* and *Epidermophyton*,—*Achorion schönleini* being classified as a *Trichophyton*. The number of species within these genera has been much reduced, as in the past the same fungus had often been described by different writers under a variety of names. Table II shows a simple classification taken from "Manual of Clinical Mycology" by Conant and others (1954).

While the diagnosis of ringworm of the scalp can often be made clinically, it should always be confirmed by microscopic examination of hair and skin scales, and if possible cultures should be made. Except in the case of favus, it is usually difficult to identify the fungus by microscopic examination alone; a clue to its identity may be obtained, but accurate identification is possible only after culture and isolation on artificial media. Precise identification of the infecting fungus may not be strictly necessary, but it is an aid to prognosis, and in some cases a guide to treatment; it is important in the study of epidemics; and it helps to place the whole subject on a basis of scientific precision. Even when no laboratory help is available, hairs and skin or nail scrapings can be placed in sealed containers and sent to a laboratory by post.

In most cases it is a simple matter to cultivate and identify the infecting fungus from ringworm of the scalp. In the laboratory or in a clinic, it is useful to keep one or more trays set up in readiness for the collection of hairs or other material. The following articles are needed: sterile gauze and 70% alcohol for skin cleaning; scalpels, epilating forceps, nail clippers, small scissors with curved sharp points for removing scales or the roofs of vesicles; a small syringe for the collection of pus or tissue fluid, sterile Petri dishes, swab sticks and slides, and a supply of culture media. The affected area is thoroughly cleansed with 70% alcohol, hairs are epilated, and scales are collected with sterile forceps and transferred to sterile containers for microscopic examination and culture. The selection of material requires care; some authorities recommend the selection of hairs while the patient is being observed under a Wood's lamp. Three or more cultures should be made from each patient. Small bottles of medium are better than Petri plates. Small rectangular bottles display the cultures better than McCartney bottles or test tubes. It is advisable to dig hairs or skin scales deeply into the medium with a scalpel rather than to use the gentler strokes used in cultivating bacteria. The most useful medium is Sabouraud's glucose agar with 20 units of penicillin and 40 units of streptomycin per cubic centimetre; cycloheximide (0.5 milligramme per cubic centimetre) may be added to prevent overgrowth of fungal contaminants. Cycloheximide (Georg *et alii*, 1954), which

is sold by the Upjohn Company under the trade name of "Actidione", is an antibiotic derived from *Streptomyces griseus*. Though quite devoid of antibacterial activity, it has the unique property of inhibiting the growth of a wide variety of saprophytic moulds, including most common contaminants; but it has little or no effect on the pathogenic fungi with the exception of *Cryptococcus*. "Actidione" is thus a most useful substance for the medical mycologist, not only in making routine cultures, but also in the search for pathogenic fungi in the soil and in the walls and floors of buildings and so on.

The appearance of hairs and skin scales infected with fungus is familiar to all, and the immediate reversion of these fungi to their saprophytic phase in cultures is equally

TABLE I¹

Thallophytes: Thallus-bodied Plants which Lack Roots, Stems, and Leaves.

<i>Algae.</i>	<i>Fungi (Mycetes).</i>
Contain chlorophyll, synthesize food from carbon dioxide and water with aid of sunlight.	Do not contain chlorophyll: are saprophytic or parasitic.
	A. PSEUDOMYCETES.
	1. SCHIZOMYCETES.
	2. MYXOMYCETES.
	B. EUMYCETES.
	(a) Non-septate mycelium.
	1. PHYCOMYCETES.
	(b) Septate mycelium.
	1. ASCOMYCETES.
	2. BASIDIOMYCETES.
	3. FUNGI IMPERFECTI.

¹ From Conant *et alii* (1954).

well known. The change in the fungus on culture is really a most extraordinary transformation. In a hair infected with *Microsporum canis*, the fungus appears as a mosaic sheath of small spores surrounding the hairshaft. In skin scales this fungus appears only as segmented branching mycelium. The culture shows a quickly growing fungus with downy or woolly aerial mycelium, producing a quantity of bright yellow pigment in the medium. On microscopic examination, the culture bears numerous large multi-septate, spindle-shaped, rough, thick-walled macroconidia or fuseaux, and in primary cultures a few small single-celled microconidia. These fuseaux are never seen *in vivo*, though they appear in large numbers when the fungus is grown on an isolated hair suspended over a flask of water. *Microsporum canis*, often called *Microsporum lanosum*, is by far the commonest cause of ringworm in Sydney, in New Zealand and also in California. In England and in the eastern part of the United States, *Microsporum audouinii* is the commonest cause of ringworm and has been responsible for large epidemics. *Microsporum audouinii* grows more slowly, produces less pigment and shows few if any fuseaux. It is usually said to be an exclusively human pathogen, but recently it has been grown from several cases of ringworm in dogs. The third, and on the whole the rarest, variety of *Microsporum*—rarest, that is, as a cause of ringworm—is *Microsporum gypseum* (*Microsporum fulvum*). This is a fast-growing fungus, rather powdery and buff to light brown in colour. Microscopically it shows large numbers of septate ellipsoid fuseaux, somewhat smaller and more variable in size than those of *Microsporum canis* and even more numerous. This species is of great interest at present, as it has been repeatedly isolated from the soil in the United States and also in Sydney. It has usually been described as an animal fungus, affecting dogs, cattle and horses, and causing sporadic ringworm of the scalp in children and of the beard in farm workers. The source of infection is now believed to be the soil rather than infected animals.

Trichophyton is fortunately not a common cause of scalp infections. Table III shows the incidence of various fungi in a series of 122 cases of scalp ringworm at the Royal North Shore Hospital. Two of the patients with *Microsporum* infections were elderly women with very soft, dry hair which had been permanently waved; the remaining 120 were children.

What is the source of infection in ringworm of the scalp? Very often there is an obvious contact—another child, or very often a kitten, usually a stray kitten. It is interesting that in animals as in humans the young are most susceptible to infection. Marples (1951) showed that apparently healthy kittens with coats in very good condition were sometimes carriers of *Microsporum canis*. Infection may be conveyed by an infected comb or barbers' clippers. When one considers the problem of ringworm infection several interesting questions arise. Where is the reservoir of infection? Why are some groups and some individuals more susceptible than others? Why are cultures of these ringworm fungi so different from their appearance in living hair? The large and flourishing cultures on artificial media certainly suggest that the

TABLE II.¹
Dermatophytes.

<i>Trichophyton</i> Malmsten, 1845. (Hair-Skin-Nails.)	<i>Microsporum</i> Gruby, 1843. (Hair-Skin.)
A. Gypseum Group.	1. <i>M. audouini</i> .
1. <i>T. mentagrophytes</i> .	2. <i>M. canis</i> .
B. Rubrum Group.	3. <i>M. gypseum</i> .
2. <i>T. rubrum</i> .	
C. Crateriform Group.	<i>Epidermophyton</i> Sabouraud, 1910. (Skin-Nails.)
3. <i>T. tonsurans</i> .	1. <i>E. floccosum</i> .
D. Faviform Group.	
4. <i>T. schoenleinii</i> .	
5. <i>T. concentricum</i> .	
6. <i>T. ferrugineum</i> .	
7. <i>T. violaceum</i> .	
8. <i>T. verrucosum</i> .	
E. Rosaceum Group.	
9. <i>T. roseum</i> .	
10. <i>T. megnini</i> .	

¹ From Conant et alii (1954).

fungi are primarily saprophytes, and that the production of human and animal disease is an accidental interruption of their natural existence. There are two lines of research in investigative dermatology which help to throw light on these problems. One which concerns the infective agent is the repeated isolation of keratinophilic fungi from the soil; the other, which concerns the host, is the study of protective substances in human sebaceous secretion and the growth of dermatophytes on chemically modified hair.

Isolation of Keratinophilic Fungi from the Soil.

Let us consider the infective agent first. The story of the isolation of keratinophilic fungi from the soil is interesting, not only for its practical importance, but also because it brings the ecology of the dermatophytes into line with what we know of the ecology of many other infections. Since their discovery over 100 years ago the dermatophytes have been regarded as obligatory parasites of man and animals, although the fact that they readily revert to their saprophytic phase of growth on artificial media does suggest that they are at least potential saprophytes. Also, as Emmons (1951) has stated, the rather sporadic nature of disease in mycotic infections of all kinds suggests an intervening saprophytic phase. The first report of a dermatophyte growing as a saprophyte under natural conditions was that of Muende and Webb (1937). Examining material taken from different parts of a shed which had housed calves infected with ringworm and was later used for horses, they found a macroscopically visible colony of *Trichophyton* on horse dung. Mandels and others (1948) isolated *Microsporum gypseum* from wool fabric buried in pots of soil at room temperature. Emmons (1951) drew attention to the soil as a great reservoir of pathogenic fungi, and showed that many of them would grow on moist sterilized soil kept at room temperature; *Trichophyton mentagrophytes* was one of the fungi grown in this way. Vanbreuseghem and Van Brussel (1952), independently of Emmons, put forward the idea that the earth was a reservoir of infection for the dermatophytes, and succeeded in growing *Microsporum canis*, *Trichophyton rubrum* and other fungi on sterilized soil and on media containing soil. Further, their stock cultures of *Microsporum* and *Trichophyton*, many of which had been main-

tained in the laboratory for some years, grew much better on soil than on Sabouraud's medium. Old cultures regained their pristine beauty, and cultures which had degenerated and become pleomorphic ran true to type once more. Not only laboratory strains but also clinical material, hairs, skin and nail scrapings yielded cultures on sterilized soil as well as or better than on Sabouraud's medium. The next step was obvious—if the ringworm fungi grew so well on soil, was it not perhaps their natural habitat? This was a fascinating hypothesis, but not easy to prove. How were the pathogens to be extricated from the mass of other living organisms in the soil? Vanbreuseghem (1952) solved the problem by offering the ringworm fungi a bait of human hair. Moistened earth in Petri dishes was baited with tufts of autoclaved hair, a method that had been used by Karling (1946). Samples of earth taken from gardens and fields were placed in Petri dishes, moistened and kept at 25° C. After five or six days some of the hairs became covered with a fine down; removed and examined microscopically, the hair was seen to be invaded and in places broken up by a fungus with mycelium and fuseaux very like those of the *Microspora*. The bait of hair had caught a keratinophilic fungus, which was obtained in pure culture by removing the hair to Sabouraud's medium. It resembled *Microsporum gypseum* very closely, but differed from it in some respects and was apparently not pathogenic. Vanbreuseghem (1952) described it as a new species of a new genus, naming it *Keratinomyces ajelloi*. It showed considerable keratinolytic power, and Vanbreuseghem suggested that the presence in the soil of such keratinolytic fungi explained in part the disintegration of naturally occurring keratinaceous material—such as the fur, the feathers and the horns of dead animals and discarded woollen materials.

TABLE III.
Relative Incidence of *Microspora* and *Trichophyton* in a Series of Scalp Infections Seen at the Royal North Shore Hospital from June 1, 1949, to July, 1955.

Name of Fungus.	Number.	Percentage.
<i>Microsporum lanosum</i> (canis)	90	73.8
<i>Microsporum audouini</i>	7	5.7
<i>Microsporum gypseum</i> (fulvum)	11	9.0
<i>Trichophyton crateriforme</i>	8	6.7
<i>Trichophyton mentagrophytes</i>	1	0.8
<i>Trichophyton rubrum</i>	1	0.8
<i>Trichophyton purpureum</i>	1	0.8
<i>Trichophyton violaceum</i>	1	0.8
<i>Trichophyton sulphureum</i>	2	1.6
Total	122	100

Ajello (1953), working in Georgia, United States of America, recorded the isolation of *Microsporum gypseum* from natural soils baited with autoclaved hair. He used the same technique as Vanbreuseghem; but subcultures from soil plates were made on media containing penicillin, streptomycin and "Actidione". Of 85 samples examined, 39 yielded cultures of *Microsporum gypseum* and three yielded Vanbreuseghem's *Keratinomyces ajelloi*. Samples of soil from various parts of New South Wales have been examined in this way (Durie and Frey, 1955). Of 76 samples examined, seven (9.2%) yielded cultures of *Microsporum gypseum* and nine (11.8%) cultures of *Keratinomyces ajelloi*.

It might be questioned whether culture from the soil provides absolute proof of the existence of *Microsporum gypseum* as a saprophyte. It might be argued that the samples of soil used had been recently infected by animals with ringworm. However, Gordon (1953) obtained the characteristic fuseaux of *Microsporum gypseum* by filtering a watery suspension of soil through a membrane filter. Fuseaux, which belong to the saprophytic phase, could not be shed on to the soil by an infected animal.

Microsporum gypseum is rare as a cause of ringworm, but apparently common as a soil inhabitant. Ajello (1953)

collected reports of 270 cases from the literature. Their distribution was world-wide. He was able to find only 61 recorded instances of its occurrence in animals, and thought it likely that the soil was the main source of human infections, animals, like man, being infected from the soil. He regards *Microsporium gypsum* as one component of the complex mycoflora of the soil, which, unlike most soil fungi, has the added ability under appropriate conditions to invade the keratinaceous tissue of man and animals and produce disease. The production of ringworm is only a very small sideline for *Microsporium gypsum*; in nature it probably plays a highly specialized role, bringing about, with other keratinophilic organisms, the breakdown of keratin into simple elements. These fungi seem to play an important part as scavengers, helping to clear away the remains of dead animals and playing a part in the renewal of that thin outer layer of the earth's surface which we call the soil and on which we all live. So far no other dermatophytes have been isolated from the soil; but this work is as yet in a very early stage, and other fungi may be isolated by variations in technique. The three species of *Microsporium* resemble one another very closely; it is quite possible that the *Microspora* and *Keratinomyces ajelloi* are mutants of an unstable parent species.

Variations in Susceptibility of Host.

The other line of research which is of interest concerns the host. It is well known that *Microsporium* infections of the scalp undergo spontaneous cure at puberty. Rothman and his collaborators (1947) investigated this phenomenon, and showed that adult sebaceous secretion was about five times more fungicidal against *Microsporium audouinii* than that of children. The fungistatic activity was shown to be due to the fatty-acid fraction, which contained odd-numbered saturated fatty acids ranging from C7 to C13. Kligman (1950), following up this work, was not able to confirm it entirely. He found that there was a marked variation in the susceptibility of children's scalps and even of different areas in the same scalp. He succeeded in producing experimental infections in the scalps of adults by rubbing in infected hairs, though it was difficult to produce them by rubbing in cultures of fungus. However, these experimental infections in adults were trivial and cleared up rapidly. Barlow and Chattaway (1955) studied the effect of chemical modification of hair on its susceptibility to fungous infection. They used clippings of normal children's hair washed in running water for twenty-four hours, extracted with ether and dried at body temperature. The hair was then treated with various chemicals. In some samples the keratin was modified by opening up its structure and breaking down cross-linkages; in others cross-linkages were increased in order to produce a more resistant keratin. The strains of fungi used were *Microsporium canis*, *Microsporium audouinii*, *Trichophyton rubrum* and *Epidermophyton*. Cultures were made on isolated hairs in a moist chamber. Hairs treated with thioglycollic acid and calcium thioglycollate in order to break disulphide bonds were attacked more rapidly than normal hair. It is of interest that thioglycollates are used in one method of permanent waving. Hairs treated with various chemicals to break down cross-linkages were rendered more susceptible to fungus attack. On the other hand, studies of hair show that there are protective substances, both natural and artificial, by which the fungal attack may be modified or prevented. Further studies in the host-parasite relationship in this disease are needed.

Summary.

A brief account of the fungi causing ringworm of the scalp is given. Methods of culture are discussed and the results of culture in a series of 122 cases are recorded.

The source of infection is discussed, with reference to the isolation of dermatophytes from the soil and their existence as saprophytes. Reference is made to the examination of soil from various parts of New South Wales, recorded elsewhere. The host-parasite relationship is discussed, with reference to protective substances in human

sebaceous secretion and the attack of chemically modified hair by dermatophytes.

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AN EPIDEMIC OF DENGUE-LIKE FEVER, TOWNSVILLE, 1954: CLINICAL FEATURES, WITH A REVIEW OF THE LITERATURE.

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THERE occurred in Townsville, North Queensland, during the first quarter of 1954, a severe outbreak of a dengue-like fever, which was estimated to have affected some 15,000 of the 40,000 inhabitants.

Because it was for some time regarded as rubella or morbilli, a not uncommon mistake (Birks, 1952), investigation was not commenced until the epidemic was on the wane. Most patients were not examined by a medical practitioner, or were examined only once, and records are scanty.

In the course of a virological and serological study (O'Connor and Rowan, 1955a), 44 patients were examined, and records of these, together with reports from practitioners, form the basis of this report. Although dengue

fever has recurred from time to time in Australia, records in the recent local literature are relatively scanty and information in the standard text-books is meagre, and it is therefore considered timely that notice should be drawn to the main manifestations of the disease together with its less common features, supported as they are now by serological proof of the aetiology, in order that physicians not acquainted with the disease may recognize it and assist in its epidemiological elucidation. Full accounts are given in the early Australian medical literature reviewed by Lumley (1943) in his monograph.

Clinical Features.

Prodromal Stage.

The prodromal stage was present in 25% of cases, and varied from slight headache and malaise a few hours before the onset to chilly sensations, fleeting pains in the joints and a prodromal rash twenty-four to forty-eight hours before.

Siler *et alii* (1926) found prodromata in 65% of cases of experimental dengue.

Onset.

The onset was abrupt in 75% of cases. Thus each day four or five men on a building project would come to work well and be stricken down in the course of the day. One subject collapsed with headache, fever and severe sweating while unconcernedly mowing his lawn.

A sudden onset was found in 84% of cases by Kisner and Lesansky (1944), and 78.8% by Stewart (1944). Chill at onset was reported in 31.8% of cases by Kisner and Lesansky (1944), in 62% by Cavanagh (1943), and in 14% by Diasio and Richardson (1944). Transient coryza may be common (Birks, 1952), and occurred in 24% of cases (Diasio and Richardson, 1944). No note of its occurrence was made in this series, but persisting respiratory symptoms were absent, a feature of importance in the differential diagnosis from morbilli (Birks, 1952).

Fever.

In a few cases in which charts were available, the majority of temperatures remained in the vicinity of 101° F. to 103° F. for twenty-four to seventy-two hours and then fell by lysis over two or three days.

Moderately common, but by no means the rule, was the diphasic type of chart. On the second or third day 44% of the subjects reported temporary symptomatic improvement. One patient, who had a titre of 1:40 with the dengue type I antigen in the complement fixation test (regarded as significant of recent infection in this epidemic—O'Connor and Rowan, 1955a) had had no febrile upset in the preceding six months. Ross (1948) found that 32 out of 46 patients were afebrile or nearly so. All had had a similar fever before.

Pain.

In 95% of cases there was a complaint of retroocular pain on moving the eyes. Characteristic of the extreme variability of the symptoms of dengue, both from epidemic to epidemic and within an epidemic, this high incidence has been found in some epidemics (88%—Cavanagh, 1943), and in others a low incidence (25%—Stewart, 1944). Frontal headache of varying severity was present in 90% of cases, pain in the back in 87%, and pain in the limbs in 77% of cases.

Perversion of Taste.

The presence of a foul taste in the mouth was remarked in 75% of cases, and associated with it usually was a total lack of desire for food and tobacco, even in patients who were not really ill. Elek (1944) noted this in 87% of cases, and Kisner and Lesansky (1944) in 3.8%.

Rash.

In two instances there was a prodromal rash. Because of its evanescent nature (it lasted in one case overnight and in another a few hours) it may have escaped observa-

tion in many instances. The rash which characterized this outbreak involved the trunk and limbs and was commonly morbilliform in character, but at times scarlatiniform, and in a few instances, especially over the *dorsum pedis*, petechial. It was present in 67% of cases and frequently terminated in a fine desquamation. In 55% of cases pruritus of the palms and soles was present. One observer stated that a fine punctate rash, later changing to general reddening, was common on the soft palate. The rashes associated with the dengue-like fevers seem to be variable in time of appearance, as well as in form. The enanthem, also referred to by Lumley (1943), was seen in this epidemic, and the main rash appeared about the fourth to fifth day. There is also another rash, described as "terminal" and appearing usually about the seventh day, which is petechial in nature and may cause confusion with typhus fever (Stewart, 1944; Sabin, 1952).

Fleming and French (1947) describe the initial rash as being profuse and the terminal rash as being evanescent. In the absence of aetiological investigation this, as also possibly other epidemics described as dengue in the literature, may refer to West Nile fever. However, all these fevers are of the one immunological family. The frequency of occurrence of the rash varies from 37% (Cavanagh, 1943) to 79% (Diasio and Richardson, 1944). In three pairs of serologically proven cases in individual households, in which the patients became ill within one to seven days of each other, the rash was present in one case and absent in the other. Sabin (1952) found that serum taken in New Guinea from personnel who had fever but no rash, when inoculated into human volunteers, produced a typical illness and rash. Siler *et alii* (1926) regarded the bloated, flushed, expressionless face with bloodshot eyes as being characteristic.

Lymphadenomegaly.

Enlargement of the lymph glands, particularly of the suboccipital and epitrochlear groups, was common. In one case, in which jaundice supervened, the spleen was palpable. Lymphadenomegaly varies from epidemic to epidemic—17% (Kisner and Lesansky, 1944) to 94% (Diasio and Richardson, 1944). Splenomegaly has been reported in 10% (Stewart, 1944) to 25% of cases (Zelig *et alii*, 1944).

Nervous System.

Mental depression during the illness and in convalescence was relatively common. One patient complained of a feeling of tension and anxiety. In another instance there was violence necessitating restraint by the family. Two patients complained of unsteadiness of gait and giddiness. Difficulty of accommodation was present in 6% of cases and photophobia in 12%. One patient within a month of a febrile illness of which details are not available developed Landry's paralysis. In this patient the titre to the dengue type I antigen in the complement fixation test was 1:40 at one month and 1:10 at two months after the onset of the illness. Another patient, during an illness which was clinically dengue fever, developed atonia and dysarthria and progressed to a state of chronic Parkinsonism. His serum gave a positive result to a titre of 1:256 in the complement fixation test with the dengue type I antigen. The immunological relationship of dengue fever to the arthropod-borne encephalitides (Sweet and Sabin, 1954; Casals and Brown, 1954; O'Connor and Rowan, 1955a) is reflected in the neurological manifestations of the disease.

Mental depression is commented on by Kisner and Lesansky (1944) and by Cavanagh (1943). Insomnia was seen by Diasio and Richardson (1944). Photophobia was reported by Kisner and Lesansky (1944). Involvement of the peripheral nervous system reported in the literature includes the following forms: weakness of the legs (Diasio and Richardson, 1944); numbness and tingling in the extremities (Kisner and Lesansky, 1944), and peripheral neuritis (Kaplan and Lindgren, 1945).

Nervous symptoms, transient paralysis, amaurosis, and encephalitic and psychic symptoms were predominant in

the 1928 epidemic of dengue-like fever in Greece (League of Nations, 1928). In the epidemic of 1942 in Queensland 21 children aged under three years suffered from encephalitis and nine died (National Health and Medical Research Council, 1942).

Alimentary System.

Perversion of taste and anorexia have already been mentioned. Nausea was prominent in a few cases, and one observer saw some patients with hæmatemesis, which he attributed to excessive use of aspirin-like drugs (Buckingham, 1954). A hæmorrhagic tendency in dengue has been described (Georgopoulos, 1928). One subject who had been in hospital for some time previous to and during his attack of dengue fever developed jaundice of the hepatocellular type. Epidemic jaundice was not prevalent at the time, and the titre to dengue type I in the complement fixation test was 32 at twenty-nine days and zero at seventy-six days after the onset. This patient had an agglutinating titre of 100 and 30 for *Leptospira pomona* in his first and second specimens of serum; but as he had been in hospital for some three months prior to the acute illness, it is unlikely that it was leptospirosis. Jaundice has not been mentioned in recent literature, but was not unknown to older observers (Lumley, 1943), and is interesting in view of the recently shown antigenic relationship of dengue fever to yellow fever (Sabin, 1950), a possibility which was hinted at by Cleland (1916) and by earlier authors (Siler *et alii*, 1926).

Respiratory System.

Apart from coryzal symptoms at the onset, respiratory involvement does not appear to be a feature of dengue fever (Birks, 1952; Diasio and Richardson, 1944).

Uro-Genital System.

No symptoms referable to the uro-genital system were met with in this series, but urgency of micturition was seen by Diasio and Richardson (1944), and orchitis with subsequent testicular atrophy by Weyrauch and Gauss (1946).

Hæmatological System.

No hæmatological studies have been performed in the recent series. Leucopenia is the usual finding. Mention must be made of infectious mononucleosis, which dengue fever can simulate. One case of this disease was encountered during the epidemic herein described, in which the blood picture was typical and the Paul-Bunnell titre 512. A hæmorrhagic tendency is common in some epidemics. Epistaxis was common in the 1942 epidemic (National Health and Medical Research Council, 1942). One patient in this epidemic with hæmatemesis had temporary thrombocytopenia, which may have been due to aspirin. Georgopoulos (1928) reported that in the Greek epidemic of 1928 multiple petechiæ appeared after the application of a tourniquet to the arm. This phenomenon was present often on the first day of the illness and always on the second day, and was used by him for the early diagnosis of the fever. Investigation of this feature by modern hæmatological techniques is desirable.

Relapse.

Relapse has been discussed by Lumley (1943). One case is mentioned, in the hope that it may stimulate observers in future epidemics to inquire into the problem.

Mrs. A., a middle-aged woman, who had lived all her life in the city, presented on March 30, 1954, with a temperature of 104° F., severe headache, retroocular pain, photophobia, conjunctival congestion, weakness of accommodation and mental depression. Three weeks previously she had had a febrile disturbance, with headache, retroocular pain, neck stiffness and lack of balance on walking. Fifty-nine days after the onset of the second illness the titre to the dengue type I antigen in the complement fixation test was 1:20.

Influence of Previous Attacks.

Like all preceding remarks, any conclusions on this aspect of the subject will be subject to review and modifica-

tion in the future, as data accumulate from cases proven in the laboratory. Mr. B., who had clinical dengue in 1942, had a bad attack in 1954. C., on the other hand, had only a minor illness, in comparison with the severity of his previous attack. Mrs. D. had classical dengue in 1942 and 1955, the latter attack being serologically proven. E., who had a typical attack in 1942, had in 1954 a titre of 40 against dengue type I antigen in the complement fixation test, yet had had no febrile disturbance in the previous six months.

TABLE I.
Clinical Findings in 44 Cases of Dengue-like Fever.

Clinical Findings.	Incidence.
Pain, retroocular	95%.
Headache, frontal	90%.
Pain in back	87%.
Pain in limbs	77%.
Taste perversion	75%.
Sudden onset	75%.
Rash	67%.
Pruritus	55%.
Temporary remission	44%.
Prodromata	25%.
Photophobia	12%.
Accommodation difficulty	6%.
Lymphadenomegaly	Common.
Mental depression	Common.
Jaundice	1 case.
Encephalitis	1 case.
Landry's paralysis	1 case.
Hæmatemesis	A few cases.

Influence of Age and Sex.

No detailed examination was made of the influence of age and sex; but from the records available, in seven families all members were affected, including children aged from two years onwards. Three adults were aged over fifty years, and the general impression was that age did not influence the occurrence of this disease. Of 68 patients whose sex was noted, 39 were males and 29 females; but in the series were 14 males from a service establishment, which would weight the figures in favour of males.

Convalescence.

Convalescence in most cases was uneventful, particularly if the attack was mild. However, in severe cases mental depression and lassitude lasting for two to nine weeks were met with. Two patients stated that they lost seven and fourteen pounds in weight respectively. One patient entered into a state of chronic Parkinsonism.

Child-Bearing.

This investigation was primarily of a laboratory nature and no systematic inquiry was made into the effect of the disease on child-bearing. Of three infants born of mothers who had suffered from dengue fever in the first trimester of pregnancy, one was hydrocephalic and two had abnormalities of the heart and great vessels; the children died in the neonatal period.

Diagnosis.

Clinically the dengue type I, dengue type II (Sabin, 1950) and West Nile fevers (Bernkopf *et alii*, 1953; Goldblum *et alii*, 1954) are very similar and would appear to occur in areas which overlap. Definitive diagnosis, essential in epidemiology, rests upon isolation of the virus. The serological methods available are the serum neutralization test (Smithburn, 1954—a procedure too lengthy for clinical use), the hæmagglutination inhibition test (Sweet and Sabin, 1954; Casals and Brown, 1954) and the complement fixation test (Sabin, 1952); their results become positive only relatively late, and there is considerable overlap between these viruses and that of Murray Valley encephalitis, so that all four viruses must be used in each test, an expensive and laborious procedure. The clinician is confronted with the problem of making the diagnosis of a fever within the first twenty-four to forty-

eight hours, when present laboratory tests are of no value. Moreover, in the absence of an epidemic, clinical criteria are not of much value on account of the extreme variability of the picture for which the disease is notorious (Megaw, 1951; Walker *et alii*, 1942). When an epidemic is present, particularly if laboratory proof is available, then very often certain features stand out which allow early diagnosis to be made. Thus, in this epidemic the features selected were the sudden onset and the presence of retroocular pain, pain in the back and limbs, perversion of taste and lymphadenopathy in the absence of persisting respiratory symptoms.

Laboratory confirmation may be of importance in relation to women of the child-bearing age, in view of the possible confusion with German measles, as nothing is as yet known of the effect of dengue on pregnancy.

Discussion.

The wide extent of the systems involved by dengue-like fevers and the variety of symptom complexes under which they may present have been discussed. The implications of these features could only be guessed at in the past, because it was not until the work of Sabin (1950, 1952) and of Schlesinger and Frankel (1952) on dengue fever, and that of Goldblum *et alii* (1954) and of Bernkopf *et alii* (1953) on West Nile fever, that specific diagnosis of the dengue-like fevers was possible. It is uncertain what position is held in this group by Murray Valley encephalitis, the symptomatology of which as described by Robertson and McLorinan (1952) in no way resembles that of dengue fever except when neurological manifestations are present, and yet they are immunologically closely related (O'Connor and Rowan, 1955a).

Various hypotheses have been put forward to explain this discrepancy in symptomatology. Previous infection with a closely related virus may modify the clinical picture (Sabin, 1952); passage of the virus through different hosts may modify its properties, as has been shown with mouse-passage virus (Sabin, 1952). Not to be overlooked also is individual variation in host response. Siler *et alii* (1926) found this during experimental infection of volunteers, who presumably had not had previous attacks of dengue-like fevers.

The answer to these problems, and also to the position of the various fevers which on clinical grounds in the past (Halliday and Horan, 1943; Judson, 1951; Weber *et alii*, 1946; Findlay and Brofield, 1943) have been separated from the dengue group of fevers, lies in more intensive virological study. As it has been shown on clinical and serological grounds that dengue-like fevers have occurred in the North Queensland area, quite apart from epidemics (O'Connor, 1955b), they are probably endemic in the area and material for study is available.

Apart from the description of the clinically similar West Nile fever (Bernkopf *et alii*, 1953; Goldblum *et alii*, 1954) and of the work of Sabin on dengue (1950, 1952), this is one of the few large epidemics of dengue-like fever which have been investigated by modern serological methods. Hitherto many fevers have been included in or excluded from the group largely according to the whim of the author (Megaw, 1951), and no means of affirming or refuting the claim have existed. Thus perusal of the clinical histories of 12 children who died from encephalitis during the 1942 Queensland epidemic indicates that in many cases the most that could be stated was that they died of encephalitis during an epidemic of dengue-like fever. Because of this, pending the completion of serological studies and the isolation of the causative virus, it is considered desirable to refer to this Townsville fever of 1954 as a dengue-like fever until its position in the group is clarified.

With the use of one antigen (Murray Valley encephalitis) in the complement fixation test, it would appear from the work of O'Connor and Rowan (1955a) that at least the dengue type I fever, Murray Valley encephalitis and West Nile fever can be separated out from the miscellaneous collection of fevers in tropical areas. More

detailed work, where necessary, could narrow the specificity of the diagnosis. The practical point is that if physicians were alert to the manifestations of these fevers cases (apart from those occurring in epidemics) could be investigated; this would be of value in disentangling the aetiology and assisting in the control of these diseases, which are economically disastrous and of considerable military importance (Sabin, 1955).

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NEONATAL INFECTION OF THE SKIN BY STAPHYLOCOCCUS PYOGENES.

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THE increase in both the number and severity of cases of neonatal skin infection by *Staphylococcus pyogenes* in recent years has stressed the importance of ascertaining what measures can be instituted to reduce or control the infection.

In the majority of the cases, the skin lesions are mild, consisting of a few small pustules, which may not attract attention unless they are looked for. Nevertheless it is these small lesions which help to perpetuate the infection in the nursery, with occasional acute exacerbations and increasingly severe manifestations of the disease. Large abscesses, cellulitis, and fatal septicæmia and pyæmia may develop.

A great deal of work has been done on the production of penicillin-resistant strains of staphylococci; this has been set out in recent publications, and need not be mentioned in detail here.

Last year a modern maternity block was opened here, and it was hoped that, in this unit, the incidence of staphylococcal infection would be greatly lowered. Such was not the case, and in a period of fifteen weeks 30 cases occurred among 102 infants (29%) in the new block, whilst only 13 cases were recorded from 98 babies (13%) in the old ward.

Edmunds and others (1955) consider that there is a free interchange of pathogenic staphylococci between nurses and babies, and between one baby and another, but that mothers do not seem to be a significant source of the infection.

These authors also found no evidence to show that the nature of the building or its proximity to any other department had any appreciable effect on the incidence of the infection. They did find that the nasal carrier rates for children born at home were remarkably low, although these children were attended by nurses from a hospital where the nasal carrier rate was high. This suggests that the degree of exposure of the babies to the carriers is an important factor, and may point to the relative unimportance of both the medical and domestic staffs, with their limited contact with the babies, as factors in the spread of the staphylococci.

The rapid appearance of *pemphigus neonatorum* due to penicillin-resistant staphylococci in the new maternity block soon after it was opened showed that little improvement could be expected unless additional control measures were instituted. At this time the following nursing arrangements were in existence at the hospital:

1. All patients were confined in the one labour ward, and the babies were transferred to a small but clean and airy

nursery immediately adjacent. Unless complications arose in the infant or mother, all intermediate patients and their babies were transferred within a matter of hours to the new block. In this block the babies were nursed on a large, enclosed and sunny veranda. Babies not transferred were nursed in the original ward.

2. Masks were worn by all members of the staff, including medical and domestic staff, entering the maternity block. Nurses were instructed to change their masks every two hours and not to handle their masks.

3. Separate sheets of sterile paper were used when the infant was weighed, and after being bathed each child was put onto a fresh towel.

4. Damp dusting of the ward was employed.

5. The majority of the babies were bathed daily, only well-known, reputable soaps being used.

6. The members of the nursing staff scrubbed their hands after attending to each baby.

7. Mosquito nets were used, and blankets were treated with "Fixanol C" (cetyl pyridinium bromide—Rountree, 1946).

At one stage the mothers were attending to the babies, who were kept beside the mother's bed during the daytime. For domestic reasons this was not persevered with, although it was our impression that some improvement had followed this method.

Despite these precautions and the enthusiastic help from the nursing staff, little success in overcoming the problem was being obtained.

In studying the infection the following points were considered to be worth investigation: (i) the incidence of the disease; (ii) the time of appearance of the lesions; (iii) the bacteriological basis of the infections; (iv) post-natal treatment as a method of control; (v) treatment of nasal carriers in the staff as a method of control.

Incidence, Severity and Site of Lesions in Babies.

Incidence.

During the fifteen weeks' period from September 4 to December 11, 1954, 200 babies were born, and of these 43 (21.5%) developed skin lesions. At this time each baby was being carefully examined daily for any skin infection, and probably some of these lesions would not have been noted except that they were being looked for. However, from the vast majority of even these small lesions staphylococci were grown on culture.

Severity.

In assessing the degree of severity of the lesions the following classification was followed: "0", no rash; "1", occasional (less than four) small pustules; "2", large or numerous pustules or abscess formation.

The appearance of these lesions has already been described by Isbister and others and by Rountree and Freeman, and our clinical observations are in entire agreement with these authors. In the majority of cases the lesions involve the skin only; but when the deeper tissues are involved, the breast appears to be particularly susceptible.

Of the 43 rashes recorded, 18 were grade 1 and 25 were grade 2. No deaths occurred. Recurrent furunculosis in nurses has also been an occasional problem.

Site.

In 46 cases the site of the lesion was recorded, and since the lesions are not uncommonly multiple, the total number of recorded sites exceeds the number of patients. The region of the groin, legs and thighs was by far the commonest site, 32 babies having lesions in this area. The head and neck were affected in only 13 cases and the abdomen was affected in 10. The umbilicus was never involved, and only two cases of conjunctivitis were recorded. The high incidence of infections in the region of the groin and thighs, which are liable to skin irritation by wet and rough napkins, and which are frequently

exposed to possible carriers during changing, is significant and worthy of attention in the prophylaxis of the infection.

Time of Appearance of the Lesions.

The average stay in hospital of the babies was ten days. An analysis of the time of appearance of the infections showed that many of the rashes appeared from the fifth to the eighth day (45%), whilst 28% appeared during the first four days. We were informed from time to time by the honorary medical staff of lesions occurring in babies after they had left hospital without having had clinical evidence of the infection. We have no accurate record of the number of such cases, but they did not seem to be numerous. It is probable that in these cases the babies had become carriers in hospital and infected themselves at home, rather than that they were infected by their parents.

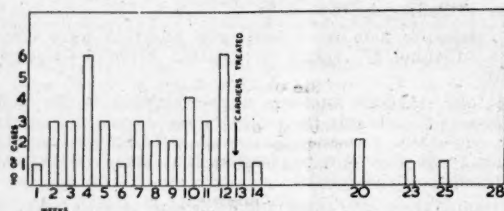


FIGURE 1.

Incidence of neonatal staphylococcal infection, Maitland Hospital.

Bacteriological Background of the Infections.

Nasal swabbings from members of the nursing staff, medical officers and members of the domestic staff were plated on blood agar. Cultures were similarly attempted from all lesions from babies and mothers. After incubation the plates were kept at room temperature for twenty-four to forty-eight hours to allow full pigment development. Single colonies, except when apparent colonial differences existed, were examined for antibiotic sensitivity by the disk method, and the coagulase test was carried out by the tube method (Gillespie, 1943).

In the earlier stages of the investigation, the sensitivity to penicillin, "Achromycin", chloramphenicol, streptomycin and "Terramycin" was tested; but later the sensitivity to penicillin only was investigated. All coagulase-positive, penicillin-resistant strains were referred to Dr. Phyllis Rountree, of the Fairfax Institute of Pathology, Royal Prince Alfred Hospital, Sydney for phage typing. Staphylococci from the babies' lesions were referred only in the earlier stages when it was necessary to establish the phage type of the infection.

Phage Type.

The staphylococci isolated from the babies' lesions were found to be penicillin-resistant, and Dr. Rountree reported them as phage type 52AV (phage type 80). The emergence and significance of this strain have already been discussed by Rountree and Freeman, who found some penicillin-sensitive strains early in 1954; since then, however, strains of this type have been resistant.

Staphylococci of similar phage type were also isolated from some skin lesions of the mothers.

Staphylococci Isolated from Anterior Nares of Hospital Staff.

Nasal swabbings were examined from all the medical officers, and all the members of the nursing and domestic staffs who were visiting or working in the maternity wards. In all, 53 persons were investigated, and in 14 cases coagulase-positive, penicillin-resistant, staphylococci were isolated. Twelve were from the nursing staff, which is a somewhat higher figure than the 31.8% found by Rountree and Barbour in 1950 at the King George V Hospital. Two doctors yielded penicillin-resistant staphylo-

cocci, and it was of interest that one of these was a resident and the other an ex-resident of this hospital. No penicillin-resistant staphylococci were isolated from the domestic staff.

Phage typing of the penicillin-resistant staphylococci revealed two carriers of phage type 80 amongst the nursing staff.

Post-Natal Treatment as a Method of Control.

It was thought that, since the staphylococci were probably widespread throughout the two nurseries, it might be of assistance to determine whether less frequent handling of the babies would reduce the incidence of infection, or whether it would be possible to increase their resistance to the staphylococcus by various post-natal procedures. Babies were therefore taken in strict rotation and were treated in one of the three following ways: (a) oiled and bathed at birth, with no other treatment; (b) oiled and bathed at birth; then given a daily bath followed by exposure to the ultra-violet lamp—one and a half minutes back and front at 24 inches (machine, "Hanovia" Number 7); (c) oiled and bathed at birth; then given a daily bath followed by 70% alcohol swabbing.

In all, 322 babies were born during this period, and 46 cases of staphylococcal infection occurred. The distribution of the cases according to post-natal treatment was as shown in Table I.

TABLE I.

Nature of Treatment.	Number of Babies Treated.	Number of Infections.
Method (a)	103	12 (11.1%)
Method (b)	118	14 (12.3%)
Method (c)	101	20 (19.8%)

There is, statistically, no significant improvement with the more elaborate methods. This was not altogether unexpected, as the more elaborate the treatment, the more exposed is the baby to contamination by carriers among the nursing staff.

Treatment of Nasal Carriers in the Staff as a Method of Control.

As no reduction in the incidence of infection was obtained with the various post-natal treatments, and as two carriers of phage type 80 had been detected amongst the nursing staff, Dr. Rountree suggested that 1% "Terramycin" ointment inserted three times a day into the anterior nares might be worth trying as a method of curing the nasal carrier state of these persons. The very considerable improvement which followed this simple procedure is shown in Figure 1. During this period Maitland was subjected to serious flooding, and the water, sewerage and electricity supplies to the hospital were cut. Despite this upset in the hot summer months the reduced incidence was maintained, and in the twenty-six weeks following the treatment of the carriers only six cases have occurred, which were caused by other phage types of staphylococci. Only one of these was grade 2. The response is all the more satisfactory when it is realized that in each of the two maternity wards only one carrier was found, treated and cured.

One of us (G.S.) has had experience of two small outbreaks in the nurseries of the Cessnock Hospital and the Kurri Kurri Hospital, and examination of nasal swabs from the staff again revealed carriers of phage type 80. Local treatment to the nose with 1% "Terramycin" ointment was followed in each instance by improvement in the ward.

Discussion.

When one considers that recommendation should be made to control neonatal *Staphylococcus pyogenes* infection, it is obvious that ordinary nursing standards, even carefully supervised, are totally inadequate. It can also be assumed

that when cases occur in the ward the staphylococcus is already widespread, whilst the appearance of fresh cases must only aggravate the vicious circle. From our present work, and from the experience of others, there seems little doubt that in any outbreak an investigation of the bacterial flora of the nasal mucosa of the staff, particularly the nursing staff, is of fundamental importance. It would also appear that local "Terramycin" treatment may be sufficient to clear the carriers. However, since tetracycline-resistant staphylococci are being reported in increasing numbers in hospitals, this may not be the ideal substance for this purpose.

Dr. D. G. Perrett in a personal communication informs us that 1% "Neomycin" ointment is non-irritating to the anterior nares, and possibly its application may be the ideal method of treatment. A further investigation is being carried out.

As we were not able to obtain any satisfactory results during the time masks were being used, we have given up their use without any ill effects. Campbell has given a review of some of the preventive measures in this problem, and she also states that she has not found masks to be of any real use, whilst Isbister and others use masks only in the premature and labour wards. In an attempt to prevent the epidemic strain from entering the ward, we think it advisable that all members of the nursing staff, particularly when they come from one of the other wards, should have nasal swabs taken and examined before they go on duty in the nursery. As penicillin-resistant staphylococci, which are not of the epidemic type, may be obtained from them, it is advisable to have any suspicious cultures phage-typed, and only carriers of the epidemic strain should be given nasal treatment. Mothers may introduce an "epidemic" strain and infect the ward; this possibly occurred in Rountree and Barbour's case, in which type 3A strain was found in a baby and its mother at a time when no other carrier was found in the nursery. Later four babies and a nurse were found to be carrying this strain.

It is advisable that all babies be examined carefully for any evidence of infection and a weekly record kept. The early institution of preventive measures when a rise in the infection rate occurs may avoid the occurrence of severe lesions.

Should the babies develop any lesions, swabbings are sent to the laboratory for culture and sensitivity tests. We have found that 1% to 2% aqueous gentian violet solution is usually satisfactory in clearing up the smaller lesions. Antibiotics should not be prescribed unless the lesion is sufficiently serious to justify their use, and then only after sensitivity tests have been carried out.

The increasing number of reported cases of neonatal infection and fatal illnesses in young children due to the staphylococcus emphasizes the warnings of many writers on the use of the antibiotics. Already it is becoming a rarity to find staphylococcal infections which respond satisfactorily to penicillin therapy, and the misuse of the antibiotics can leave us with a virulent organism against which we have no defence in systemic infections.

Nurses should be instructed to report and go off duty from the nursery should they develop any obvious staphylococcal infection.

The post-natal treatment of the baby consists of oiling and bathing at birth and no other treatment. Sterilized greaseproof paper is placed under each child before it is weighed. As has already been mentioned earlier, it was our impression that nursing of the babies by the mother during the day is helpful in controlling the spread of the infection. This is the practice of some hospitals and possibly has much to recommend it, particularly as it means a lowered exposure to possible carriers amongst the staff.

It is likely that one of the factors associated with the increased incidence is the modern tendency to centralization, with the gradual disappearance of the smaller hospitals. This point has been discussed by Rountree and Barbour, who make the following statement:

It may well be that hospital authorities should reconsider the practice of congregating large numbers of newborn infants in large and often overcrowded nurseries and substitute, so far as present conditions permit, smaller units.

Since these infections may produce severe or fatal illness, it is strongly urged that babies or mothers who develop staphylococcal infection in the maternity block should be isolated, and Campbell (1954) considers that at least 10% of the nursery beds should be permanently available as isolation beds with adequate staff available. We feel also that the question of making this a notifiable disease might be considered by the proper authorities.

Attention to the persistence of staphylococci in the blankets, on the cots, in dusting powders *et cetera* is important. Isbister and others (1954) grew epidemic staphylococci from clean blankets returned from the laundry, and a fall in the infection rate was obtained by soaking the blankets in "Dettol" (one in 40 solution) for eight to twelve hours before sending them to the laundry. Rountree and Armytage (1946) have also shown that blankets may be heavily contaminated.

We have given up the use of mosquito nets, as they seem to serve little purpose. In the hot weather they increase sweating, and screening of the ward is usually quite adequate. The importance of damp dusting is emphasized by the work of Rountree and Barbour.

Summary.

1. Investigations of neonatal infection of the skin by *Staph. pyogenes* at the Maitland Hospital showed an incidence of 21.5%.
2. The staphylococci were penicillin-resistant and were of phage type 80.
3. No reduction in the incidence of infection was obtained by careful attention to nursing standards.
4. Investigation of the bacterial flora of the nurses' anterior nares revealed two carriers of penicillin-resistant *Staph. pyogenes*, phage type 80.
5. Local treatment to the anterior nares with 1% "Terramycin" ointment resulted in a pronounced and lasting reduction in the disease.

Acknowledgements.

We wish to thank Dr. Phyllis Rountree, of the Fairfax Institute of Pathology, Royal Prince Alfred Hospital, Sydney, for carrying out the phage typing of the staphylococci. In addition Dr. Rountree gave much helpful advice during the investigation and in the preparation of this paper. We wish also to acknowledge the help and cooperation received from the honorary medical officers and the nursing staff of the Maitland Hospital.

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Reports of Cases.

FATAL AIR EMBOLISM RESULTING FROM THE USE OF A COMPRESSED AIR DIVING UNIT.

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WITH the increasing popularity of underwater activities in which compressed air diving units are employed, certain of the risks attendant on their use require emphasis. Polak and Adams (1932) reported ten accidents, two of which were fatal, among personnel undergoing "aqualung" training, and nine of these cases were concerned with ascents from less than 30 feet after short exposures to pressure. Polak and Tibbals (1930) reported a fatal case of air embolism in a person using a "lung" following ascent after a stay of short duration at a depth of 30 feet. A similar fatality after an ascent from a depth of 15 feet is described by Behnke (1932).

This present report describes a classical case of air embolism following diving with a self-contained breathing apparatus, and one of us was able to observe the reactions of the patient from the moment of onset of the symptoms.

The breathing apparatus or "aqualung" consists essentially of a compressed air cylinder with air at a pressure of about 2000 pounds per square inch, and a reduction valve which reduces this pressure to any desired level. The pressure is maintained at the desired level by a water-activated diaphragm and a demand valve regulator connected to a mouth-piece. The exhaled air is liberated to the water through two exhaust valves. The air pressure in the lungs thus approximates closely the surrounding water pressure.

Clinical Record.

A healthy man, aged eighteen years, was diving in sheltered water 20 feet deep, and at the time was undergoing a test in which the "aqualung" was discarded and a free ascent made from this depth. He was quite conversant with the use of the apparatus and had made numerous previous dives with it. His actions were observed by two examiners stationed underwater at a depth of 20 feet.

On reaching the surface he clung to a buoy, immediately complained of feeling weak and nauseated, and vomited. Suddenly he experienced difficulty in breathing in both inspiratory and expiratory phases, and this was accompanied by limb pains and an occipital headache. Within several minutes of coming to the surface he was assisted

from the water, completely exhausted and semi-comatose. There was generalized cyanosis which rapidly deepened, and the breathing became irregular and shallow and soon passed into a phase of apnoea.

The radial pulse was not palpable, but the femoral pulse was strong, with a rate of 120 per minute, and was regular in rate and rhythm. The extremities were cold and beads of sweat were noted on the forehead. Several minor convulsive movements of the facial muscles occurred, and the eyes were rolling. There was a notable absence of intercostal muscle movement on inspiration, and the airway was clear throughout.

The patient was placed in a head-low position, warmth was applied and artificial respiration was administered, together with oxygen from a Davis escape apparatus, and peripheral massage was carried out. Within about ten minutes there was a fairly rapid return of colour to the face, though the breathing was still irregular and had to be assisted intermittently for about twenty minutes. Normal respiratory rhythm was established after thirty minutes. At the end of this period the patient was still in a state of severe shock and became comatose, responding only to painful stimuli. However, this condition lasted for only about ten minutes, after which apparent rapid improvement occurred. One hour after the onset of symptoms there was considerable general improvement in his condition. There was no cyanosis, though pallor was still apparent; respiratory embarrassment had disappeared and the pulse was palpable at the wrist, having a rate of 86 per minute, but it was of poor volume. The patient felt nauseated, but did not vomit, and he experienced some loss of power together with paraesthesia in the right arm and hand. The weakness was mainly in the abductors of the limb, good power being present at the wrist and in the hand.

Three hours after the accident the patient vomited once and then felt much improved. At this stage there was no evidence of shock, and the pulse rate was 80 per minute. He was taken to his home and placed in bed, and instructions were left that any untoward symptoms were to be reported immediately.

Within an hour the parents of the boy became alarmed about his condition and he was admitted to hospital at 9.30 p.m., seven hours after the onset of symptoms. On his admission to hospital he complained of discomfort all over the front of his chest, and this was made worse by breathing. He said also that he felt nauseated and that his right arm felt numb. On examination of the patient, the pulse rate was 120 per minute, and the blood pressure was 80 millimetres of mercury, systolic, and 60 millimetres, diastolic; the heart sounds were clear, and superficial crepitations were heard in the second and third left intercostal spaces beside the sternum and to a lesser extent on the right side of the sternum. The crepitations had no relationship to the cardiac rhythm and were best heard on deep respiratory movement, but were heard only for a short period. The right arm was limp and flaccid. Morphine was administered and the patient went to sleep.

Seven hours later he awakened, complaining of breathlessness and retrosternal pain, but he did not appear greatly distressed. The pulse rate was 122 per minute, the respirations numbered 36 per minute, and bilateral moist râles were heard at the bases of both lungs. There was some blood-stained sputum. At this time more morphine was administered and the patient again slept.

Two hours later, at 6.30 a.m. on the following day, the pulse rate had risen from 120 to 176 per minute and the respiratory rate from 32 to 50 per minute, and moist râles could be heard all over the chest. The extremities were cyanosed and there was some weakness of the muscles of the right arm. An X-ray film of the chest revealed diffuse mottling throughout both lung fields, and a diagnosis of acute pulmonary oedema was made.

At 11.30 a.m. bronchoscopy was performed under local anaesthesia, and revealed copious thin, watery, blood-stained fluid. The sucking out of this fluid provided the patient temporarily with the only relief experienced after

the onset of the pulmonary oedema. Venesection, the administration of morphine, and the intravenous injection of "Digoxin" were of no avail.

Eighteen hours after his admission to hospital the patient's condition had greatly deteriorated and he became unconscious with pronounced chest recession. He was placed in a respirator, but died twenty-one hours after his admission and twenty-eight hours after the onset of symptoms.

Post-Mortem Examination.

The autopsy was performed thirty-nine hours after death. The body was that of a young adult male, five feet eleven inches in height and weighing 133 pounds. He was of slight build and fair nutrition. The brain weighed 1708 grammes and was somewhat tense and congested, but the cerebral hemispheres were normal in shape and symmetrical. On examination of sections, no hæmorrhage or areas of softening could be seen. The pons, cerebellum and medulla were normal.

There was no pneumothorax, but a slight excess of straw-coloured fluid was present in both pleural cavities. The larynx and pharynx were normal, but white frothy fluid was present in both main bronchi and in the trachea. The lungs were free of adhesions and normal in shape, but they were enlarged, heavy, moist and darker than normal. On examination of sections, some congestion was noted in the lungs together with pronounced oedema, and copious frothy fluid could be expressed from their cut surface.

The heart was normal in shape and size, but on the posterior surface of the right ventricle a few small sub-pericardial petechial hæmorrhages were present. There was a slight excess of straw-coloured fluid in the pericardial cavity. There was no evidence of any air in the right atrium or ventricle. The valves were normal. The coronary arteries were patent and almost completely free of atheroma. A small accessory right coronary artery was adjacent to the main right coronary artery. Throughout almost the entire myocardium of the left ventricle and also in the muscular interventricular septum extensive hæmorrhages were present, and these had the gross appearance of recent infarcts. It was considered that these infarcts were due to air emboli within the coronary arteries. No similar hæmorrhages could be seen in the myocardium of the right ventricle. No significant pathological change could be seen in any of the other organs.

Histological Findings.

No significant pathological change was seen in any of the sections from the cerebral cortex, basal ganglia, cerebellum, pons or medulla. The alveolar walls of the lung were congested, and considerable oedema was present. In some areas the air sacs contained erythrocytes and numerous polymorphonuclear leucocytes together with oedema fluid, and the histological picture was that of early lobar pneumonia. In the heart there was a widespread recent myocardial infarction. In the affected areas the muscle fibres were hyaline with indistinct borders, and many were devoid of nuclei or had nuclei undergoing degeneration. The interstitial tissue was infiltrated with polymorphonuclear leucocytes, many of which had undergone karyorrhexis. Extensive hæmorrhage was also present in the interstitial tissue. In some areas the polymorphonuclear accumulation was distorting and displacing the degenerating muscle fibres and even replacing the fibres entirely.

Discussion.

In retrospect the diagnosis is obvious. The air taken into the lungs under pressure at a depth of 20 feet expanded as the patient came to the surface and the external atmospheric pressure became less. This increased intrapulmonary pressure caused rupture of the alveoli with entry of air into some radicles of the pulmonary vein, resulting in systemic air embolism, maximal in this case in the coronary artery.

During diving with such "open circuit" equipment the air is delivered to the lung at the same pressure as that of

the water surrounding the diver. At a depth of 20 feet, therefore, the pressure on the alveolar wall would be approximately one and two-thirds atmospheres or ten pounds above normal. (The pressure increases one atmosphere for every 33 feet below the surface.) If the breath is held during ascent from this depth the additional ten pounds per square inch is far in excess of the maximal pressure necessary to rupture the alveolar wall and thus allows entry of air into the vascular system. It is also possible at high pressure for air to pass through the uninjured alveolar walls.

A condition of fright can apparently cause spasm of the glottis, preventing exhalation during ascent and thus causing over-distension of the lungs. Under these circumstances deaths can occur from traumatic air embolism from depths of only 15 feet. On the other hand, experienced divers have been able to make safe ascents from depths of 100 feet without special equipment merely by exhaling continuously whilst surfacing. This point is surely of the utmost importance in training personnel in the use of diving equipment.

Besides myocardial infarction, traumatic air embolism may result in cerebral embolism, peripheral embolism involving usually the limb muscles, or hæmoptysis. The pulmonary over-distension may become manifest as a spontaneous pneumothorax or interstitial emphysema.

It is essential that traumatic air embolism should be clearly distinguished from caisson disease or, as it is commonly known, "the bends". To develop caisson disease a diver or other worker in compressed air must have been exposed to relatively great depths and/or pressure, and the duration of exposure is also important. It is certain that a short exposure at a pressure of 20 feet of water would not produce "bends". Caisson disease is due to the presence of organic nitrogen bubbles in the blood-stream. One should remember that all gases dissolve in fluid, including blood, in direct proportion to their pressure, and therefore at a depth of about 132 feet the blood-stream is theoretically able to absorb about five times the volume that it can absorb at normal atmospheric pressure. In addition, fatty tissues take up a greater volume of nitrogen than do other tissues. The clinical symptoms appear usually from fifteen minutes to one hour after a diver has come to the surface, but may not become manifest for about six hours. The severity of the symptoms depends largely on the volume of gas liberated and on the site of its liberation. The most common manifestations are pain in the limbs, dizziness and paresis, and much less common are dyspnoea, collapse and unconsciousness.

Another condition from which air embolism must be distinguished is that of oxygen intoxication, which can occur when a diver has been using an oxygen rebreathing apparatus. The outstanding symptoms in this case are usually epileptiform convulsions, nausea, dizziness, disturbances of vision or muscular twitching. The nature of the equipment used will probably give an indication of the causal factor.

Whilst decompression is of prime importance in caisson disease, it can be of no value in a case of traumatic air embolism such as has been described. It would seem that immediate treatment of the shock with strict bed rest and the administration of morphine and oxygen are all that is indicated.

Summary.

A case of fatal traumatic air embolism following the use of a compressed air diving unit is reported. The accident occurred in a healthy youth after an ascent from a depth of 20 feet.

The clinical and pathological features are described, and both the cause of the air embolism and the differential diagnosis are discussed.

Acknowledgements.

We are grateful to Dr. A. D. Pye for permission to use the records of the Brisbane General Hospital.

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ARTERIO-VEINOS FISTULA OF THE LEFT COMMON ILIAC ARTERY AND VEIN.

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THOUGH the operation for ruptured intervertebral disk was performed first in 1934, the first report of a vascular complication was not recorded until Linton and White (1945) described the finding of an arterio-venous aneurysm between the right common iliac artery and the inferior vena cava some seven months after a lumbar laminectomy for protruded disk. After the diagnosis had been made, operation was performed and the aneurysm was excised.

Holscher (1948), fully aware of this complication, actually showed at operation how easily with a closed pituitary forceps vascular injury could be sustained.

Seeley, Hughes and Jahnke (1954) described two cases in which the injury occurred during operation by careful surgeons fully aware that vascular injuries might occur.

Glass and Ilgenfritz (1954) were fortunate that in their case the vascular accident was revealed when the patient was turned to a supine position at the end of the operation. A fall in blood pressure and a greatly increased pulse rate to 160 per minute indicated that some vascular incident had occurred.

Harbison (1954), called upon to repair an aneurysmal sac arising as a vascular complication after disk surgery, became interested in this subject and collected 30 cases from a questionnaire sent to about 100 surgeons. He included four of the earlier cases. His conclusions indicated that, during the course of operation for removal of lumbar vertebral disks, on rare occasions injuries to the aorta, the vena cava and the iliac vessels might occur. He noted that in over half of the cases described the injuries were not manifested at operation, and therefore the diagnosis was frequently not made. The injuries might occur at the hands of competent surgeons who were well aware of the risk of the complication. Harbison drew attention to the fact that not only do biting instruments contribute to the risk, but the variation in the thickness and permeability of the anterior longitudinal ligament and annular ring may be such as to allow vessels held rigidly to be nipped against the lumbar spaces when the body is in the prone position, with subsequent damage to the vascular structures.

Leavens and Bradford (1953) in one of their cases discovered at operation a fissure of the anterior annulus fibrosus, and indicated how easily an instrument could pass through and cause vascular damage. Burchell (1954) recognized this vascular complication as an unusual form of heart disease.

A further case is now described in which an osteophyte was found bridging across the space between the fifth vertebra and the sacrum overlying an aperture in the annulus fibrosus and causing, after operation, the formation of a fistula between the left common iliac vein and artery.

Clinical Record.

A, a healthy truck driver, aged thirty-six years, was admitted to hospital on August 21, 1953, with the diagnosis of a herniated fifth lumbar disk. Operation was performed

and the disk was removed by curettage; no complications were noted at operation. Three days after operation the patient complained of distension of his abdomen, but it subsided after the passage of flatus. Seven days later the swelling returned. It was not relieved by symptomatic medication. A plain X-ray examination of the abdomen at this time revealed no abnormality, and he was discharged from hospital on September 11, 1953.

He was readmitted to hospital on November 11, 1953, complaining of shortness of breath on exertion, nausea, pulsation in the neck veins, diarrhoea and loss of weight.

Although he worked in a brewery, there was no evidence of alcoholic excess. Examination of the patient revealed orthopnoea, the pulse rate being 104 per minute. The pulse was regular, but collapsing. The blood pressure was 140 millimetres of mercury, systolic, and 60 millimetres, diastolic. The jugular venous pressure was raised, and the veins were filled to the angle of the jaw in the upright position. A grade II systolic murmur was heard at all areas; a soft diastolic murmur, grade II, was heard over the aortic area. Rales were present at the bases of both lungs, the liver was enlarged, and ascites was present, but there was no pitting oedema of the sacrum or ankles. An electrocardiogram showed poorly defined T waves throughout, and in leads II, III and V₄ the T waves showed shallow inversion. There was no evidence of either right or left ventricular hypertrophy. Pulmonary congestion and general cardiac enlargement were apparent in the X-ray film of the chest. Apart from liver enlargement, no abnormal swelling was found on examination of the abdomen.

It was recognized that the causation of the congestive cardiac failure was not self-evident. In view of the sequence of events following operation, the surgeon was asked to review the patient for suggestions to account for the possible relationship between operation and congestive cardiac failure. It was considered that the operation did not contribute to the condition of cardiac failure. Further investigations were carried out. Paracentesis abdominis yielded 3500 cubic centimetres of rusty fluid; the protein content was 2.8 grammes per centum, the serum bilirubin content was normal, and only an occasional leucocyte was found in the fluid. The patient's temperature occasionally rose to 99° or 99.6° F.; the basal sedimentation rate was normal. The Wassermann and Kahn tests produced negative results. A full blood count gave normal values. Attempts at blood culture were unsuccessful.

The patient was treated for congestive cardiac failure, with some measure of relief. Various diagnoses were considered. In view of one expression of opinion suggesting tuberculous pericarditis, it was considered that, although supportive evidence was meagre and the Mantoux test result was negative, the pericardial fluid should be examined. The ensiform approach was used; the surgeon aspirated two cubic centimetres of serous fluid, then blood flowed into the syringe. The needle was withdrawn and the patient was returned to the ward. His condition deteriorated and it was clear that cardiac tamponade had taken place. Blood from the pericardial sac was aspirated and arrangements were made to drain the pericardium. The patient died suddenly.

A post-mortem examination revealed blood and clot in the pericardial sac. A small puncture on the anterior aspect of the right ventricle with surrounding ecchymosis was found; the ventricle had not been punctured, but a small vein had been damaged. The heart weighed 14 ounces and the right ventricle was hypertrophied. Yellow serous fluid was found in the pleural and abdominal cavities. Chronic venous congestion of the liver was found, and a small haemorrhage was seen in the pancreas. The kidneys were congested. The peritoneum of the posterior abdominal wall was thick and bound down. There was a communication 10 millimetres in diameter between the left common iliac vein and artery, directly anterior to the disk between the fifth lumbar and the first sacral vertebrae. Bridging across the space was a large osteophyte with a sharp edge. The vertebrae were freely movable.

Discussion.

This case supports Kredel's contention, quoted by Harbison, that if the bony skeleton is not properly supported in the prone position, pressure upon the abdomen may force the vessels against the vertebral bodies. In this instance there was degeneration or injury of the annulus and an osteophyte straddled the aperture in the annulus between the fifth lumbar vertebra and the sacrum. Further, it is unfortunate that the clinical findings, which in retrospect could only have been interpreted as due to an arterio-venous shunt, should have been ignored because of the strong conviction that no complication had arisen through operative interference.

As Leavens and Bradford (1953) point out, the emphasis that Dandy (1944) placed on "removing the entire vertebral disc" has initiated a more radical trend with increased complications due to injury to associated structures adjacent particularly to the fourth and fifth lumbar disks. Further, it is now recognized that the anterior annulus and anterior longitudinal ligament are particularly likely to become attenuated, with increasing risk from perforation by curette or forceps.

Conclusions.

1. A case of arterio-venous fistula of the left common iliac vein and artery following operation for removal of the fifth lumbar disc is described.
2. Sudden death occurred in the course of investigation following paracentesis of the pericardial sac due to hæmopericardium.
3. It is acknowledged that injuries can occur even in competent hands and that these vascular complications, if recognized, can be effectively treated.

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TWO CASES OF APPENDICITIS IN NEW GUINEA NATIVES.

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FROM time to time indigenous patients are operated upon in this Territory for "appendicitis". These no doubt appear in statistical returns, but very seldom is a histopathological report submitted on the organ removed at operation. The following two cases are considered to be of interest in view of the generally admitted rarity of the condition.

Case I.

Weieni, a male patient, aged twenty-one years, a native of Woodlark Island in eastern Papua, was a student at the Native Medical Training School at Iduabada, near Port Moresby. He was admitted to the Native Hospital, Port Moresby, on October 29, 1954, and examined by me at

10 a.m. His story was that he had been seized with sudden abdominal pain the previous afternoon, and had vomited three times during the night. He did not report sick until the following morning, when the pain, from being generalized, had settled in his right side. He also complained of dysuria and frequency of micturition during the night, and of strangury with some blood in his urine on that morning. His bowels had not been open since the onset of the pain. No previous history of pain in the belly of a like character was obtained.

On examination, the patient was seen to be a somewhat fat and flabby youth in considerable distress. His temperature was 99.2° F. and his pulse rate 78 per minute, and his respirations numbered 20 per minute. He was tender on pressure in the right iliac fossa and the right loin. There was no rigidity in his abdomen, but a colleague elicited rebound tenderness. A rectal examination produced vague tenderness on the right side. A white cell count revealed a leucocytosis of 20,000 per cubic millimetre; 94% were neutrophile cells. Examination of a catheter specimen of urine revealed the following findings: there were five to 10 pus cells per high-power field; erythrocytes numbered three to five per high-power field, and hyaline and granular casts were present; albumin was present. The patient was regarded by me as suffering from acute pyelonephritis, and was treated accordingly, with antibiotics. However, his condition deteriorated rapidly; by 3 p.m. his pulse rate had risen to 102 per minute and examination of his abdomen revealed pronounced rigidity on the right side. At 3.30 p.m. I opened his abdomen under general anaesthesia. There was no free fluid in the peritoneal cavity. The appendix was retrocaecal and adherent to the right ureter, the tip being stuck to the lowest portion of the kidney pelvis. It was removed without difficulty, and the abdomen was closed without drainage. One bottle of whole blood (\pm 500 millilitres) was given during the operation, followed by 500 millilitres of saline-glucose solution.

Two days later the abdominal wound was oozing thick stinking pus. A culture yielded a staphylococcus and a coliform bacillus, either or both of which were resistant to all antibiotics except oxytetracycline. The wound discharge and the patient's urinary symptoms rapidly cleared up without side effects under treatment with this drug, and he made an uninterrupted recovery; he was discharged from hospital on the fourteenth day after operation.

On macroscopic examination, the removed appendix was acutely inflamed with a perforated gangrenous patch near the tip. The lumen was distended with hemorrhagic pus. The pathological report was: "Acute inflammatory process with necrosis near distal extremity of appendix."

Case II.

Kerimus, a man, aged thirty years, is a sergeant in the Pacific Islands Regiment stationed at the Regimental Depot, Taurama Barracks, near Port Moresby. He is a native of Kavieng Sub-District, New Ireland. He was admitted to the Native Hospital, Port Moresby, on January 26, 1955, for investigation and treatment. He gave a history of more than two years of recurrent attacks of pain in the right side of the abdomen occurring at intervals of two to three months and lasting up to four days. The pain bore no relation to food or bowel action. He did not admit to urinary symptoms at any time. He had no pain on admission to hospital.

On examination of the patient, there were no physical signs of disease in his chest or abdomen. His spleen was palpable, but not outside the limits of normality for one of his race and environment. A blood count gave the following information: the erythrocytes numbered 4,600,000 per cubic millimetre, the hæmoglobin value was 95%, and the leucocytes numbered 6000 per cubic millimetre. His urine contained no casts, red cells or pus cells. His faeces contained no ova of ankylostoma or ascariis. Radiographs showed his lung fields to be clear, and no stones in his urinary tract. The report on an X-ray examination with a barium meal was as follows: "Caecum irregular, static in outline. Appendix not filled; slight tenderness on pressure

over ileo-caecal region; other parts of colon within normal limits. Findings are suggestive of chronic inflammatory condition of caecum, ileocolitis due to chronic appendicitis or tuberculosis."

In my view this appeared to be an instance of so-called "chronic" or "relapsing" appendicitis without much reason for removal of the organ, but the patient was very anxious to have an operation and in these circumstances it was thought that laparotomy was justifiable. On February 1, 1955, I opened his abdomen under general anaesthesia. A right lower paramedian incision was employed. The appendix was discovered lying in a well-marked mesenteric fold running medially towards the brim of the pelvis. It did not appear to be inflamed or particularly bound down, but was removed. On examination it was seen to be short (1.25 inches) and appeared to taper towards the tip. The lumen contained no faecal matter, and the mucosa appeared normal to the naked eye. The pathologist's report was as follows: "The submucous tissue is well infiltrated with chronic inflammatory cells, plasma cells and lymphocytes." Sergeant Kerimus made an uninterrupted recovery, and was discharged from hospital on February 14, 1955.

Comment.

These two cases are of no intrinsic interest beyond the fact of their occurrence in natives of New Guinea, amongst whom proven inflammation of the appendix is considered rare. It is suggested, however, that there may be some possible connexion between this assumed rarity and certain known nutritional factors or dietary customs. It is generally conceded that acute appendicitis is typically a disease of civilized communities whose normal diet contains a high proportion of partially preserved and/or concentrated foodstuffs such as white bread, tinned meat and fish, margarine, refined sugar, tea and coffee and preserved milk. It is relatively frequent among the European communities of New Guinea; for instance, 13 patients with acute appendicitis were treated in the European Hospital, Port Moresby (population 5000), in the year 1954.

However, the indigenous inhabitants of the territory consume only fresh foods until or unless they achieve economic dependence on Europeans. The Woodlark Islander normally lives on fish, yams, coconuts and fruit—a diet rich in first-class protein and vitamins. But when Weieni joined a Government school at Port Moresby he received a standard ration consisting of unpolished rice, tinned meat, tinned fat, wheatmeal, salt, sugar and tea. This has a high calorific value and contains sufficient vitamins to prevent deficiency diseases, but no item can be considered "fresh" in the same sense as every article of his home diet is fresh. Furthermore, Weieni told me that he did not attempt to obtain fruit or vegetables while at the school, but spent his money on tobacco, white bread and "lolly-water". Weieni may be said to have suffered from acute appendicitis on the European model—a coincidence which may possibly be suggestive.

The case of Kerimus is fundamentally different. He comes of a somewhat sophisticated native group in New Ireland who have long been accustomed to a dietary of mainly European origin, consisting of rice, tinned meat, tea, *et cetera*, supplemented only to a small extent with local fish, coconuts and fruit. Since his enlistment in the Pacific Islands Regiment, however, for some two years Sergeant Kerimus has been receiving a very liberal and varied diet of native vegetables and fruits of all kinds with fresh meat or fish daily. Preserved foods are issued to the men of this unit only when they are on exercises, which occur relatively infrequently.

It would appear that Kerimus, unlike Weieni, suffered from a condition which was essentially a healed process, in which acute inflammation had comparatively long since settled down, if indeed it had ever been present to any great degree. It is suggested, for what it is worth, that the process in Kerimus's appendix started in the days when he was eating a proportion of preserved foods while he was employed in Kavieng, and that the process was assisted towards resolution by the more natural diet he

received while a soldier. His case may be described as a reversal of that of Weieni.

It is clear that no real conclusions can be drawn from only two cases even of such comparative infrequency as these; but it is suggested that the dietary circumstances involved may have some significance in their aetiology.

Acknowledgements.

My acknowledgements are due to the Director of Public Health of the Territory of Papua and New Guinea for permission to publish these cases, and to Dr. A. V. G. Price, pathological specialist, for the histological reports.

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REPORT OF A CASE OF TYPHOID FEVER FOLLOWING CHOLECYSTECTOMY.

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AND

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Mrs. A., aged thirty years, underwent cholecystectomy in a Melbourne hospital on April 15, 1955, and developed typhoid fever, confirmed by blood culture, on April 29, the fourteenth post-operative day. The clinical history was as follows.

She had suffered from bronchiectasis for several years and had undergone a left lower lobectomy in about 1944. This had resulted in considerable improvement in the condition. There was, however, still slight residual bronchiectasis in the remaining lobes.

In November, 1953, one month after the birth of a child, she experienced abdominal pain which was said to have been "sharp, central and radiating through to the back". This first attack, which lasted from five to ten minutes, was diagnosed as pancreatitis and was relieved by pethidine. Between November, 1953, and February, 1955, she had many such attacks, some of them accompanied by vomiting.

In February, one of the attacks was accompanied by jaundice and by the passage of clay-coloured stools and dark urine. Operation was advised, and on April 10, 1955, she entered hospital for this purpose. The operation was performed on April 15, after having been postponed because of "bronchitis"; there was no other significant pre-operative history.

At operation, cholelithiasis and cholecystitis were evident, and calculi were present in the common bile duct. Cholecystectomy, exploration of the common bile duct, removal of calculi and choledochostomy with the use of a "T" tube were carried out. No culture was attempted on the specimens removed at operation.

Early in the post-operative period coughing was severe, as was to be expected in a case of bronchiectasis, and was associated with wound hæmorrhage. On the second post-operative day this required surgical intervention. Many small vessels in the subcutaneous tissues were bleeding, and these were controlled by diathermy. On the tenth post-operative day, cholangiography was performed and no abnormality was revealed. The "T" tube was removed on the following day.

On April 29, the fourteenth post-operative day, the patient developed pyrexia (temperature up to 106° F.), rigors and profuse diarrhoea. Blood taken on May 2, the seventeenth post-operative day, yielded a growth of *Salmonella typhi*, phage type E1. Examination of faeces gave negative results for *S. typhi*.

TABLE I.
Summary of Clinical, Bacteriological and Serological Findings.

Date.	Days After Operation.	Clinical Summary.	Bacteriological Results. ¹			
			Vi.	"H."	"O."	Others.
10.4.55	-5	Entered hospital.				
15.4.55	0	Cholecystectomy performed.				
29.4.55	14	Pyrexia, rigors, diarrhoea. Commenced "Terramycin" therapy for 6 days.				
2.5.55	17	Blood culture.				<i>S. typhi</i> El.
4.5.55	19	Serum agglutinations.	20	2048*	512	
7.5.55	22	Serum agglutinations. Transferred to infectious disease hospital.	40	1280+*	640	
9.5.55	24	Serum agglutinations. Urine culture.	10	1280	5120+	
		Faeces culture (3 consecutive specimens from 8.5.55).		10,240	640	} No <i>S. typhi</i> isolated.
16.5.55	31	Serum agglutinations. Discharged home.	10	2560	640	
26.5.55	41	Serum agglutinations.	?	640	320	
29.6.55		Serum agglutinations.	One-fifth negative.	80	80	
1.9.55		Urine culture. Faeces culture (3 consecutive specimens).				} No <i>S. typhi</i> isolated.

¹ The agglutination tests were carried out at the Public Health Laboratory, University of Melbourne, Infectious Diseases Hospital, Fairfield, and St. Vincent's Hospital, Melbourne. Phage typing was carried out at the Public Health Laboratory.

* These two investigations were carried out at different laboratories.

The condition subsided with the exhibition of "Terramycin". This had been commenced before the results of the bacteriological investigations were available.

On the twenty-second post-operative day, the patient was transferred to an infectious diseases hospital, where treatment with chloramphenicol was instituted. Convalescence was uneventful, and the patient was discharged home on May 26, forty-one days after operation. She was last examined by one of us on September 1, 1955, when she was found to be quite well.

Before a summary is presented of the clinical, bacteriological and serological findings, the following points should be borne in mind: (i) The patient, as far as we can determine, has never had T.A.B. inoculations. (ii) Organisms were never recovered from faeces and urine. (iii) An epidemic of coconut-borne typhoid fever, also of phage type El, was present in Melbourne in the latter part of 1953, and the patient admits that both she and her husband partook of some desiccated coconut just prior to her initial illness in 1953. It could not be ascertained in retrospect whether this coconut was derived from stocks known to have been contaminated.

When this case of typhoid fever was first brought to our notice, all home contacts were investigated and none was found to be a carrier. With the exception of Baby A., whose faeces only were investigated, blood, urine and faeces were examined from all members of the family. Amongst the other possible contacts, there are no known type El typhoid carriers.

All nursing and domestic staff who attended the patient in hospital were investigated serologically, and none was found to be a typhoid carrier.

Comments.

The history of this patient, taken in conjunction with the high titres obtained in the agglutination tests so soon after the onset of the disease, suggests that the patient has had previous experience with *S. typhi*. It is wondered whether or not the patient had contracted typhoid fever late in 1953, and had been an unsuspected carrier ever since. Pijper and Crocker (1943) report that there is some serological evidence to show that persons may harbour the infecting bacilli in the tissues for a long time without excreting them in the urine or faeces. Osler and McCrae state that typhoid carriers have been found who have never shown any clinical evidence of the disease.

It is suggested that operative interference with the gall-bladder caused typhoid bacteraemia with clinical manifestations of the disease as outlined in the clinical history.

An analogy may be drawn between this and the recurrence of disease which sometimes takes place when an area of osteomyelitis is subjected to operative interference.

A review of the available literature has failed to reveal any other cases in which this complication of cholecystectomy has occurred, and any comments on this case will be welcomed.

Acknowledgements.

Thanks are due to the Medical Superintendents of Saint Vincent's Hospital and the Royal Children's Hospital for their cooperation, and to the staffs of the various laboratories for carrying out all agglutination tests; in particular to Dr. M. Wilson, of the Public Health Laboratory, University of Melbourne, and Mr. R. Christie, bacteriologist at Saint Vincent's Hospital. We are grateful to Dr. E. Forbes Mackenzie, of the Victorian State Health Department, for his valuable assistance in preparing this report.

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INTESTINAL OBSTRUCTION DUE TO ORANGE PITH: A REPORT OF TWO CASES.

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In 1950 Ward-McQuaid reported four cases of intestinal obstruction due to food and drew attention to the large number of substances that might be responsible. This was amply illustrated by the correspondence that followed the publication.

During the last two weeks of October, 1955, I performed a laparotomy in two cases of small bowel obstruction due to orange pith; one of these had a fatal outcome.

Case I.

A female patient, aged seventy years, was admitted to hospital with a history of colicky abdominal pain of eighteen hours' duration. This was associated with frequent vomiting of copious amounts. Two hours after the onset the pain had passed off, only to recur several hours later. For some years she had suffered from diabetes

melittus, which was adequately controlled by dietetic restriction.

Examination revealed her to be an ill woman who was in obvious pain and who vomited during the examination. Her pulse rate was 100 beats per minute, and her blood pressure was 170 millimetres of mercury, systolic, and 110 millimetres, diastolic. There was some central abdominal distension with acute tenderness below and to the left of the umbilicus. The hernial orifices were clear. Intestinal sounds were increased and maximal with each episode of pain. Rectal examination revealed no abnormality. A plain radiograph of the abdomen showed distended loops of small bowel with fluid levels, and a provisional diagnosis of gall-stone intestinal obstruction was made.

After intravenous therapy had been commenced the abdomen was opened under heavy "Nupercaine" spinal analgesia. A lower left paramedian incision was used and the ileum was found to be distended to a point two feet from the ileo-caecal valve. Obstructing the intestine at this point were two segments of an orange, each representing approximately a quarter of the fruit. These were removed through a longitudinal incision in the dilated bowel proximal to the site of obstruction. This incision was closed transversely with two layers of sutures.

The patient's immediate post-operative condition was satisfactory, and at the end of the second day the abdomen was soft to palpation and borborygmi could be heard. However, at this stage her general condition deteriorated with the onset of a diabetic acidosis, which was uncontrolled by appropriate insulin and fluid therapy. Peripheral circulatory failure rapidly ensued and she succumbed during the fourth post-operative day.

At autopsy the only abnormality found was a small pulmonary embolus. There was no evidence of peritonitis or residual intestinal obstruction.

Case II.

A female patient, aged thirty-one years, was admitted to hospital with a history of thirty-six hours' colicky abdominal pain. This was associated with frequent vomiting and absolute constipation. Two days before the onset of this pain she had had an artificial pneumoperitoneum induced for unilateral pulmonary tuberculosis.

On examination she was afebrile, with a pulse rate of 110 beats per minute. The abdomen was distended (probably owing mainly to the pneumoperitoneum), and acute tenderness was present in both iliac fossae, but especially the right. Intestinal sounds were increased and were maximal with each attack of pain. Digital examination of the vagina revealed no abnormality apart from tenderness in both fornices. A plain radiograph of the abdomen, taken with the patient in the erect position, showed distended loops of small bowel with fluid levels. A diagnosis of acute small bowel obstruction was made and she was prepared for laparotomy.

The abdomen was opened through a lower right paramedian incision and distended coils of ileum presented. At a point two feet from the ileo-caecal junction the gut was obstructed by a large firm bolus; distally, the remaining part of the ileum was collapsed. Attempts to massage this bolus onwards were unsuccessful, so the bowel was opened proximal to the point of obstruction and it was extracted. It was obviously the remains of an orange, and the patient subsequently admitted that she had eaten several oranges two days previously. Her recovery was uneventful.

Commentary.

In view of the frequency with which reports of cases such as these are appearing in the literature, it would seem that the condition is not particularly uncommon. It is probable that only a small proportion of cases actually come to laparotomy, and partial small bowel obstruction offers a likely explanation for the colicky abdominal pain that may be experienced after ingestion of fruit with a

high fibre content. No point is served by further comment upon a subject already so adequately covered by Ward-McQuaid.

Reference.

- WARD-MCQUAID, J. N. (1950), "Intestinal Obstruction due to Food", *Brit. M. J.*, 1:1106.

TAY-SACHS DISEASE: REPORT OF THREE CASES IN ONE FAMILY.¹

By R. HERTZBERG,
Sydney.

In 1881 Tay described a familial disease in infants. The characteristic ocular sign of this condition is the appearance of a cherry-red spot at the macula of each eye. In 1887 Sachs described the autopsy findings of this disease and called it amaurotic idiocy. Higier in 1901 gave the condition the name of Tay-Sachs disease (Wyburn-Mason, 1943).

The amaurotic idiosyncrasies comprise the following: (i) the infantile form (Tay-Sachs); (ii) the late infantile form; (iii) the juvenile form (Batten-Mayou and Vogt-Spielmeier); (iv) essential lipid histiocytosis (Niemann-Pick disease).

These diseases have been recognized predominantly as a disturbance of phosphatide metabolism. Amaurotic idiocy together with such diseases as the xanthomatoses, Gaucher's disease, Niemann-Pick disease, and lipochondrodystrophy form a group known as the lipidoses. The common characteristic to be found in each of these conditions is an accumulation of large, poorly staining lipid-containing cells. These are histiocytes which arise primarily from the reticulo-endothelial cells in all parts of the body. The specific lipid in these diseases has been identified in most cases—that is, cholesterol in the xanthomatoses, cerebroside (kerasin) in Gaucher's disease and sphingomyelin in Niemann-Pick disease. The stored lipids in the foam cells of the juvenile form of amaurotic idiocy have been demonstrated as a mixture of phosphatides and cerebroside (Givner and Roizin, 1944).

In the past, the tendency has been to emphasize the differences between the various forms of amaurotic idiocy. But more recently the trend has been towards emphasizing the similarities. Thus Tay-Sachs disease and Niemann-Pick disease may, according to some workers, be only variants of the large group of phosphatide lipidoses. Thus the former one shows the cerebro-retinal complex only and the latter the hepatosplenic type only, or a mixture of both. In addition, the retinal picture may be identical in both diseases, a finding which intimates their close relationship. Added to this is the fact that both diseases occur almost exclusively in the Jewish race (Klein, 1954).

The infant with Tay-Sachs disease is normal at birth, and as a rule no abnormality is noticed until the sixth month, when it becomes weak and apathetic. It fails either to raise its head or sit up owing to weakness of the muscles of the neck and back. The grasp, formerly firm, becomes weak. As time goes on the child develops progressive flaccid paralysis, which is finally replaced by spastic paralysis. Convulsions may occur, mental deterioration increases and finally the child is entirely helpless and marasmic and usually dies from inanition or intercurrent infection.

The vision deteriorates *pari passu* with the general bodily and mental deterioration, so that blindness is added to the picture. Often an extremely slight and slow response of the pupils to light indicates that there is some visual activity present (Walsh, 1947).

¹This paper was read at the General Scientific Meeting of the Royal Australasian College of Surgeons in August, 1955.

The ocular signs of Tay-Sachs disease are characteristic and are similar to those seen in sudden obstruction of the central retinal artery. Around the macula there is a round, brilliantly white area fading off to the normal fundus. In the fovea itself is a small dark spot with somewhat fuzzy margins varying in colour from brownish to cherry red. Later optic atrophy develops and a chalky white disk and attenuated vessels are seen, but the remainder of the fundus remains normal. The white opacity is due to thickening and degeneration of the ganglion cell layer which may be swollen to enormous dimensions. It is not the result of oedema. The red spot at the macula is due to a contrasting attenuation of the fovea, or sometimes it is due to its disappearance with the formation of a hole through which the choroid is clearly visible (Duke-Elder, 1945). The degeneration of the retinal ganglion cells is similar to those changes which occur in the ganglion cells throughout the central nervous system.

The late infantile form of amaurotic idiocy first becomes manifest in the second and third years of life. It is marked by the appearance of optic atrophy unaccompanied by the cherry-red spot at the macula. The fundus changes are of a pigmentary nature. There is no racial predilection and the disease runs a rather slow course with a gradual process of mental disintegration. The physical decline and neurological manifestations, such as decerebrate rigidity and bulbar symptoms, appear late in the clinical course at a stage close to the fatal termination, which occurs usually about the end of the fourth year. This disease variant is regarded as a transition from the infantile type on the one hand to the juvenile type on the other. Anatomically the disease process is characterized by features almost indistinguishable from those encountered in the infantile form.

In the juvenile form of amaurotic idiocy loss of vision, which may be the first symptom, has its onset at about the sixth year. Mental deterioration may occur at about the same time or soon afterwards. Epileptic seizures may develop a few years later, and death usually occurs between the age of seventeen and twenty years. The fundus picture of the juvenile form is that of a pigmentary disturbance, and this may be either a degeneration resembling *retinitis pigmentosa* or confined to the macular region.

Niemann-Pick disease is an heredo-familial disease occurring predominately in Jewish children, and is fatal as a rule before the third year. The infant appears to be normal at birth, but soon begins to show physical and mental retardation. The abdomen enlarges as the liver and spleen become enormous. When the disease is fully developed the infant is apathetic and dull and the skin has a yellowish-brown appearance. The clinical picture is that of an anemic and emaciated idiot with an enlarged abdomen. Occasionally when the fundus is examined a cherry-red spot may be found, identical with that seen in infantile amaurotic idiocy. The syndrome of progressive emaciation and idiocy, usually in a Jewish child below the age of three years, with massive enlargement of the liver and spleen is typical of Niemann-Pick disease (Nelson, 1955).

Occurrence.

Infantile amaurotic idiocy is almost exclusively confined to Jewish children. The late infantile and juvenile forms are not restricted to any particular race. Consanguinity of parents is common.

Heredity.

Amaurotic idiocy is regarded as a recessive characteristic, but this is by no means fully established. The juvenile form of the disease is probably due to an autosomal recessive gene. The carrier state can be determined by the presence of an increased incidence of vacuolated lymphocytes in the blood smears of persons who are heterozygotes for the trait (Raynor, 1952).

Reports of Cases.

CASE I.—A, a male, was the second child of healthy parents. He was a full-term infant weighing eight pounds

four ounces at birth. The confinement was normal. The child sat up at the age of nine months and appeared to be quite normal until the age of eleven months, when he was unable to sit up and he became listless. He was brought to the hospital when eighteen months old. He was then an unintelligent child and did not appear to recognize people, but his hearing was acute. A sudden noise produced a convulsion—a condition known as hyperacusis. The child deteriorated and died at the age of twenty months. Examination of the fundi soon after his admission to hospital revealed bilateral optic atrophy with a well marked cherry-red spot at each macula which had a dense white surround. Histological examination of the central nervous system demonstrated swelling and degeneration of the ganglion cells.

CASE II.—B, a female, was the sixth child of the family. There were four older children who were alive and well. At birth B weighed eight pounds four ounces. She sat up at the age of six months and made normal progress until the age of nine months. By this time she was beginning to crawl, and her parents noticed that she fell a great deal while attempting to do so. At the age of eleven months she was no longer able to make any attempt to crawl, and she was also no longer able to sit up.

At the time of her admission to hospital she was unable to move any limbs. At the age of nine months the parents noticed that she began to change from a bright and alert child to one who was able only to lie in her cot displaying no interest in her surroundings. At the age of thirteen months she ceased all attempts at speech. At the age of fourteen months the parents considered that she was blind. When brought to hospital she was in a stuporose condition, and she died forty-eight hours after her admission. There is no record of the appearance of the fundus. The clinical story leaves no doubt as to the diagnosis.

CASE III.—C, a male child, was first examined at the age of six months. He was brought along because the mother stated that for two months she thought the child was losing power in his limbs and that his grasp was becoming weak. The child was otherwise apparently quite normal and had been making uneventful progress. The mother had used a mydriatic in each eye. When asked what she had noticed wrong with the child she gave the above history and stated that she thought the child had Tay-Sachs disease. She requested to be informed whether the child had a cherry-red spot in each eye. Examination of each fundus revealed a well-defined cherry-red spot in the centre of a pale area surrounding the macular area.

In this case the diagnosis had been made early owing to the alertness of the mother who had had prior experience of the disease in two other siblings. The family history failed to produce any evidence of the disease other than in the three children of this generation. The paternal great-grandfather was a Jew, and apart from this there was no Jewish blood in the family. In respect therefore of the influence of the racial factor, three generations were unaffected and the disease occurred in the fourth generation.

Summary.

The amaurotic idiocies are briefly reviewed and three cases in one family are described.

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Reviews.

High Blood Pressure, by George White Pickering, M.A., M.B. (Cantab.), M.D. (Ghent), F.R.C.P.; 1955. London: J. and A. Churchill, Limited. 9½" x 6", pp. 556, with 106 illustrations. Price: 65s.

THIS book by an acknowledged master of the subject should be read by everyone interested in hypertension. It reviews in detail the pathological physiology of the condition and less fully but adequately the clinical manifestations and treatment. Professor Pickering considers that high blood pressure is inherited as a graded characteristic in the same manner as height and not as a mendelian dominant. What is commonly regarded as hypertension is only the right hand of a curve that alters with age. He states that there is a quantitative but not qualitative difference between those readings above the commonly accepted standards of normality and those below those standards. It is pointed out that this assumption indicates that no single cause can be postulated but that the causes of hypertension must be largely environmental and multiple and the same as those factors that produce variations of blood pressure with age in the community at large. In this country, apart from special examinations for life assurance and entry to the armed forces, most physicians have not been wedded to a fixed dividing line between normal and abnormal blood pressures, and Professor Pickering's hypothesis will not alter the currently recognized criteria for treatment. He stresses the view that high systolic without corresponding rise in diastolic pressure in the elderly and in patients with increased stroke output of the heart should be separated from those conditions in which both the systolic and diastolic pressure are raised.

The 26 pages devoted to treatment of hypertensive patients are full of common sense and should be read by all practitioners. He makes the plea, which unfortunately requires to be made at this time, that patients are human beings and should be treated as such and not treated purely as examples of high blood pressure. All modern drugs are discussed in a clear and authoritative manner. Perhaps the only criticism is that the initial subcutaneous dose of hexamethonium advocated (25 to 50 milligrammes) is likely to produce severe postural effects in some patients and that a wiser dose would be 10 milligrammes. The depressive effects of Rauwolfia are not mentioned and perhaps there is a little more enthusiasm for hydralazine than would be accepted by Australian physicians.

The book is a first-class review of the subject. On the basis of experimental investigation a hypothesis that sheds light on the etiology of hypertension is expounded and a balanced view of the clinical course and treatment of the condition is given.

An Introduction to Psychiatry, by Max Valentine, M.D., D.P.M.; 1955. Edinburgh and London: E. and S. Livingstone, Limited. 7½" x 5", pp. 306, with many illustrations. Price: 15s.

THE author of this new, short book on psychiatry is senior lecturer in the Department of Mental Health, University of Aberdeen, and honorary consultant at the Aberdeen teaching hospitals. In his preface, he states that his purpose in inflicting on medical students and practitioners another book on psychiatry is to present the subject "in such a way that it will be consistent with his training in applied biological science", and integrated with general medicine. This he accomplishes in an interesting, refreshing and intelligible way, and the main usefulness of the book will be as a short introduction to stimulate interest in the subject, as its title implies. However, some sections are so brief that anyone without a background of reading in psychology and psychiatry would find them difficult to follow—for instance, his review of psychoanalytic theory in Section 6. In fact, the brevity of a few sections is so tantalizing that one is almost goaded into looking up the references to the literature at the end of each chapter, which, of course, is highly desirable.

It is good to see chapters on development and child psychiatry preceding those on adult syndromes, instead of being placed at the end of the book as they often are in other text-books. The brief illustrative case histories in the body of the text and the more detailed ones at the end of the book are useful, that of Hermann Goering the psychopath deserving special mention. The book is attractively bound and printed, but there are many annoying misprints and several mistakes in spelling. The chapter on treatment and management is excellent from the point of view of the general practitioner. The book is not without its dashes of

humour. For instance, in dealing with the hypoxic condition sometimes encountered in high altitude flying the author tells of one pilot who attempted to "land" on a cloud, and of another who returned from a reconnaissance mission convinced that he had secured some particularly daring photographs. Later it was discovered that in fact he had urinated into his camera. At times it is difficult to find a detailed reference in the book because decimal subdivision of the various sections is used instead of page-numbering. It is to be hoped that future editions will revert to the orthodox system of page-numbering.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"Life Stress and Essential Hypertension: A Study of Circulatory Adjustments in Man", by Stewart Wolf, M.D., Philippe V. Cardon, Jr., M.D., Edward M. Shepard, M.D., and Harold G. Wolf, M.D.; 1955. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 9" x 6", pp. 262, with illustrations. Price: £4 2s. 6d.

The authors have tried "to review the data linking circulatory adjustments to life experiences".

"An Introduction to Pool Exercises", by Elizabeth Bolton, M.C.S.P., H.T., and Diana Goodwin, M.C.S.P., H.T., with a foreword by J. W. T. Patterson, M.D., F.R.C.P.Ed.; 1956. London: E. and S. Livingstone, Limited. 8½" x 5½", pp. 48, with illustrations. Price: 5s.

Intended to stimulate physiotherapists "to explore the possibilities of the medium of water for themselves and to work out their own routines".

"The Interpersonal Theory of Psychiatry", by Harry Stack Sullivan, M.D., edited by Helen Swick Perry and Mary Ladd Gawel, with an introduction by Mabel Blake Cohen, M.D.; 1955. London: Tavistock Publications, Limited. 8" x 5½", pp. 411. Price: 35s.

The first book from the unpublished lectures of Harry Stack Sullivan who died in 1949.

"Ciba Foundation Symposium on Porphyrin Biosynthesis and Metabolism", edited by G. E. W. Wolstenholme, O.B.E., M.A., M.B., B.Ch., and Elaine C. P. Millar, A.H.W.C., A.R.I.C.; 1955. London: J. and A. Churchill, Limited. 8" x 5½", pp. 320, with illustrations. Price: 30s.

Another of the "Ciba Symposia", many of which have been reviewed in this journal.

"The Clinical Approach in Medical Practice", by G. E. Beaumont, M.A., D.M., F.R.C.P., D.P.H.; 1956. London: J. and A. Churchill, Limited. 9" x 6", pp. 483, with many illustrations. Price: 45s.

The book has been designed to form a companion volume to his "Applied Medicine".

"A Hundred Years of Nursing at St. Mary's Hospital, Paddington", by Sir Zachary Cope; 1955. London: William Heinemann (Medical Books), Limited. 7½" x 5", pp. 152, with illustrations. Price: 10s. 6d.

There is a chapter on nursing in general and then the history of nursing at St. Mary's Hospital is discussed.

"Medical History of the Second World War: The Royal Air Force Medical Services", edited by Squadron Leader S. C. Rexford-Welch, M.A., M.R.C.S., L.R.C.P., R.A.F.; 1955. London: Her Majesty's Stationery Office. Volume II: "Commands." 9½" x 6", pp. 727, with many illustrations. Price: £3 15s.

Deals with nine Home Commands and with three closely allied formations—the Second Tactical Air Force, the R.A.F. Regiment and No. 60 Group.

"How to Help Your Growing Child", by Ursula Grahle. London: New Knowledge Books. 7" x 4½", pp. 31. Price: 3s. Based on the philosophical work of Rudolph Steiner.

"Colour and Healing", by Gladys Mayer. London: New Knowledge Books. 8" x 5", pp. 70. Price: 4s. 6d.

Based on the philosophical work of Rudolph Steiner.

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References to articles and books should be carefully checked. In a reference the following information should be given: surname of author, initials of author, year, full title of article, name of journal, volume, number of first page of the article. The abbreviations used for the titles of journals are those adopted by the *Quarterly Cumulative Index Medicus*. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

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MENTAL HEALTH AND WORK.

In his somewhat cynical essay "In Praise of Idleness", Bertrand Russell writes that work is of two kinds: first, altering the position of matter at or near the earth's surface relative to other such matter; second, telling other people to do so. He thinks that the second kind is capable of indefinite extension, and adds that there are not only those who give orders, but those who give advice about what orders should be given. Work, of course, consists in the expenditure of energy; many people apply the word only to what has well been termed gainful employment. Work is often looked on as something unpleasant and laborious for which a wage or salary is paid. Incidentally therein lies the ultimate reason for the problem confronting present-day industry. A man works when he cuts his front lawn or trims the hedge, he works when he helps his wife with the washing-up, he works if he throws stones at the next-door cat come to steal his chickens—he is not paid for any of these displays of energy. His wife also, be it known, works just as hard as he does in the home, and she receives no money for what she does. Even Bertrand Russell, writing his essays of greater or lesser moment, was working as he wrote, and no doubt had hopes of financial gain from his efforts. These considerations notwithstanding, if a solution could be found to problems associated with employment in industry, non-industrial work would present little difficulty. The purpose of this discussion is to introduce to readers a book entitled "Mental Health and Human Relations in Industry".¹ It

¹ "Mental Health and Human Relations in Industry", edited by T. M. Ling, M.A., D.M. (Oxon.), M.R.C.P., with a foreword by The Right Honourable Lord Horder, G.C.V.O., M.D., F.R.C.P.; 1954. London: H. K. Lewis and Company, Limited. 8½" x 6", pp. 284, with 10 illustrations. Price: 21s.

consists of a series of chapters by nine authors, edited by Dr. T. M. Ling, who is medical director of Roffey Park Institute and Roffey Park Rehabilitation Centre in Great Britain. Students of social medicine will find in this book much that bears on the present-day state of unrest in industry. No effort will be made to review the book as a whole, but rather attention will be called to some of its more important aspects.

It should first of all be explained that each of the nine contributors to this volume is at present, or has at some time been, associated with the Roffey Park Institute. This institute was established immediately after the second World War as an Industrial Rehabilitation Centre for persons suffering from neurosis. It might be supposed that this book would be coloured by the particular kind of work carried out at Roffey Park or by the outlook and atmosphere created there. It does not seem to be. As a matter of fact international courses have been held and a course on occupational health, sponsored by the World Health Organization, was held in 1953. Many discussions took place at Roffey Park, and delegates from twelve European countries decided *inter alia* that there was a similarity among the basic problems of human relations in industry in all their respective countries. In the atmosphere created by this kind of discussion outlook would be enlarged and a general rather than a local view would be taken, and this the Roffey Park authors have done.

The terms mental health and human relations, we are told by T. M. Ling, are partly interchangeable. They include all the activities, procedures and interpersonal relationships that contribute to harmonious relationships at work, irrespective of the type of occupation. When people work together, there is created a complex situation which may be of benefit or harm to them. If there is no effect one way or the other, the association cannot surely be very close. If adjustment does not take place, some person or set of circumstances must be to blame. Ling quotes the social conception of health of the World Health Organization: "Health is a state of complete physical, mental and social well-being." T. A. Lloyd Davies in his section of the book states that people who conform to this definition are sick, because they suffer from emotional sterility—but more of that later. Ling tries to clarify the word industry. He rightly will not accept the popular application of the word only to the manufacturing industries, but, pointing out that "industry" is the equivalent of the Latin word *industria*, meaning simply "work", he extends the term to cover employment in any form of socio-economic activity where people work together for a common purpose. Primitive people had no word for work as it is known in industry today. Hunting was their chief occupation, because they had to find food. When man began to make things which he sold, he worked for himself; he worked at his trade when he liked and for as long as he liked—in the words of Bertrand Russell's definition, he altered the position of matter at or near the earth's surface relative to other such matter. As society evolved, communities in different places found it necessary to form organizations or combinations of persons for industrial undertakings. Someone had to direct operations. Foremen and managers appeared—Bertrand Russell's group of persons who told people to work. It is impossible

in this place to attempt even an outline of the development of present-day industry. If an attempt was made we should recount successes and failures, hardships, frustrations, personal triumphs, cruelties, exploitations, records of good lives and records of bad, the continuous and increasing supply of amenities which have helped or hindered man in his physical, mental and moral progress. We should emerge from a discussion on the subject with the certain knowledge that in any kind of community set-up there will always be those who lead and those who follow, and that both leaders and followers will need to achieve mental health if life is to be worth while for them. Ling names six facets of the work situation, all interlocked, which are necessary if work is to be emotionally satisfying and if the individual is to maintain reasonable mental health. They are: money, prestige, security, a sense of belonging, approval and creativeness. "To enable people to remain mentally happy and at peace with themselves, they must feel that what they do in life matters." One reason why people must feel that their job is socially important, is that their emotional needs are still similar to those of more primitive people whose hunting has already been mentioned. The important statement is made that all organized work involves a certain degree of personal stress. We know that the overcoming of stress, whether it comes in the form of a consistent pressure or as separate difficulties to be surmounted, strengthens a man's mental and moral fibre. We shall all therefore agree that a certain amount of stress is good for a man. At the same time unnecessary stress is better avoided. Hence we note with approval that Ling points out that sources of stress in industry are often much accentuated by inconsiderate management, by insecurity, by adverse physical conditions and by fatigue. "Cumulative stress in industry shows itself individually in aggressive behaviour, pessimistic obsessional reverie, anxiety neurosis or psycho-somatic illness. Collectively it is manifested by a variable combination of strikes, sickness, absenteeism and high labour turnover." Ling insists—and it is only another way of saying what we have already stated—that life without stress would be a life of low achievement, and that it is necessary for industry to strike a balance between achievement and stress in the light of current cultural patterns.

Dr. T. A. Lloyd Davies quotes, at the beginning of his chapter on society and work, words of John Ruskin: "Industry without art is brutality." He also quotes May Smith, who said that men work for many reasons: to earn money, for power and dignity, because of interest in the work, or to earn leisure or to deaden thoughts. He adds that others work for companionship and because work "provides endless opportunities for sympathy, love, anger, elation and even 'envy, hatred, malice and all uncharitableness'". The main reason for work is, he thinks, often ignored, and that is that work is a social habit. Work—he states that it must not be confused with gainful employment—"is the best, if not the sole, means of bringing the individual into relation with events going on around him". He describes several patterns of work—the cybernetic (that which has a feed-back message to the worker), perceptual (distinct from the feed-back type), contemplative and creative. These patterns cannot be discussed. Davies has decided views on creative work. He quotes

Peter Ustinov, who said that "there is no joy in happiness". He agrees with Ling that prestige, security and approval are, "because of the vanity of man", of great import. He differs from Ling who holds that what men "do in life really matters"; he holds that what they do that gives them a glimpse of the next world is what really has significance. He adds to avoid possible contentious argument that "their work should give knowledge of some Being or Force greater than themselves". This, of course, puts the whole argument on a very high plane. Not everyone will be willing to discuss it on such a plane, but the effort will surely be worth while. Perhaps the views of Davies may be summed up by saying that it is what a man is that counts. We can now see the force of the remark made by him that has already been quoted, namely, that man who is in a "state of complete physical, mental and social well-being" is sick and that his sickness is one of emotional sterility. Davies goes so far as to state that for an industrial renaissance man must cease to be content with happiness—"work must give joy and in this joy men shall find Reality". Though this may be dubbed a Utopian ideal, we must admit that in proportion as men attain it, the less shall be seen of unrest and aggression in every walk of life. And this brings us to the last aspect of this book chosen for discussion.

Dr. R. F. Tredgold writes a chapter on the handling of aggression. He is a psychiatrist, and he holds that education is an important function of the psychiatrist in industry. He tries to analyse the problem, and states that there will be agreement that the behaviour known as aggression is as common a danger to harmony as any other form of behaviour. He names some others—selfishness, envy and idleness—which "are perhaps more difficult to see and to handle". Aggression is so common and damaging as to call for special consideration. He lays great stress on the understanding of motives. He points out what most of us have known for a long time, that after injury to a person's pride, the commonest cause of aggressive behaviour is probably fear. There are other more subtle causes. To cut the discussion short we may refer to Dr. Tredgold's example of a doctor or nurse in a psychiatric hospital who will tolerate with equanimity the most violent abuse from a patient, because they understand the reason for the abuse and have been trained to handle such situations. He points out that in industry, where interviewing is one of a manager's chief tools, the same kind of understanding and control has equal application. He suggests that aggression need not play a large part for ill in industrial relations. Many of its ill effects could be avoided if as much study and discipline were applied to its control as are commonly spent on favourite sports and hobbies. Some of the signposts to control are the understanding of our own and other people's emotions, the control and direction of instinctive reactions, and the planning of ways which will avoid unnecessary antagonism, or which will allow it to be used for good rather than ill effects. To say that the road pointed out is slow and hard does not justify refusal of an attempt to travel on it. We may point to industry and to what we may regard as the mess that is sometimes created in it. We need not, however, go beyond the ranks of our own profession to be forced to deplore happenings that threaten our unity. This book edited by Ling is full of parables

which we may apply to our own profession and to ourselves. In his introduction Ling tells us that Aristotle's "good life" is to be found in a life of activity and in doing things well, particularly with other people—"activity according to a standard of excellence". The medical profession should set an example by the united and cohesive way in which it can, even metaphorically, "alter the position of matter at or near the earth's surface relative to other such matter".

Current Comment.

ANTICOAGULANTS AND CORONARY INFARCTION.

A PROCEDURE destined to arouse considerable divergence of medical opinion was introduced into clinical practice almost a decade ago. This was the use of drugs having the action of suppressing the coagulability of blood, and hence known as anticoagulants. In the first instance, dicoumarol and heparin were the only compounds available. Various other drugs have since been introduced with some slight easing of the rigours of clinical control. However, attention has been focused, not so much on the efficiency of particular anticoagulants, as upon their general usefulness in preventing thrombo-embolic phenomena. A myocardial infarction is a sign of generalized arterial disease and a warning that further embolic episodes may be anticipated. The use of anticoagulants to prevent these further episodes, both in the acute stage of recovery and later during resumed activity, has aroused much controversy, and even today it is scarcely possible to lay down precise principles of therapeutic activity, even in good hospital circumstances and with intelligent and cooperative patients. Just after the second World War a committee was set up by the American Heart Association to assess the efficiency of anticoagulant drugs in the treatment of coronary infarction. I. S. Wright *et alii*¹ reported on the preliminary findings after the study of 800 patients admitted to hospital as emergencies after acute myocardial infarction, of whom approximately half were treated in the first few weeks of recovery with dicoumarol. Death occurred in 24% of those patients treated conservatively, and in 15% of those treated by anticoagulants. It was suggested that the excess of deaths in the first group was due to further thrombo-embolic complications. However, this apparent vindication of dicoumarol was by no means generally accepted. Many more smaller series of cases were reported, and the use of anticoagulants began to spread out into the non-acute phase of recovery. E. Lund² reviewed the progress of 17 patients with cardio-vascular thrombotic disease treated by the regular administration of dicoumarol for periods of from two to sixteen months. No deaths occurred, but three patients developed major haemorrhagic complications. Lund concluded that anticoagulant therapy was useful, but should be used only under strict laboratory control. J. W. Keyes *et alii*³ reported on the results of the treatment with dicoumarol of patients who had suffered infarction of the myocardium. Despite some severe haemorrhagic episodes, the over-all survival rate after two years of continuous therapy was higher than that of similar but untreated patients. A more accurately controlled series of patients treated by anticoagulants in the acute phase of myocardial infarction was reported by I. S. L. Loudon *et alii*⁴ from the Radcliffe Hospital, Oxford. Altogether 200 patients were observed in the survey, and there were no complications in those treated by anticoagulants. The death rate in the control group was 41% and in the treated group was 25%. The differential of survival expectancy was approximately the same as that of the American Heart Association series.

The Oxford workers concluded that anticoagulant therapy in the acute phase of recovery was of particular value in patients over sixty years of age, moderately or severely shocked, and with little or no previous impairment of cardiac efficiency.

At this time, some thought was paid to the effectiveness of anticoagulants in the different degrees of severity of the myocardial infarction. R. H. Furman *et alii*⁵ classified patients in the following way: as "very poor risk" if there had been a previous infarction or if there was concurrent metabolic disturbance; as "poor risk" if there were signs of cardio-vascular failure or of early metabolic disease; as "good risk" if the patient, apart from his infarction, was in good health. By comparison with a control group it appeared that the anticoagulants gave no benefit either in the very poor or in the good risk groups, but did help the survival of moderately ill patients. H. I. Russek and B. I. Zohman, in an editorial in the same journal, suggested that about 40% of patients with myocardial infarction needed no more than conservative treatment from the onset. In particular they stressed the danger of rushing off to hospital the patient with a new infarct. Mortality was greatest in the first two days after the infarction, and anticoagulants were of no use at that time. I. S. Wright, again in the same journal, disagreed with the other authors and stated that many more patients needed anticoagulant therapy than Russek had suggested. Wright laid down certain precise criteria for the administration of the newer anticoagulants and compared his own personal findings of a 7.2% mortality rate in the treated patients and a 12.9% rate in those treated conservatively. All of these patients had been mildly or moderately ill at the onset.

In a later paper I. S. Wright *et alii*⁶ presented a final report of the American Heart Association survey of 1031 patients with myocardial infarction. On the basis of Russek's method of classification it was found that for moderately ill patients the death rate was 14% in the control group and 7% for those treated by anticoagulants in the acute phase of recovery. The survival rate of good risk patients was not improved by anticoagulants, but those treated suffered less from subsequent non-fatal thrombo-embolic complications. The authors concluded that, provided therapy was adequately controlled, anticoagulants should be given to all patients who survived the first impact of myocardial infarction. However, agreement on the use of anticoagulants was still not general, and D. R. Cole *et alii*⁷ who studied the long-term prognosis of 285 patients who suffered from infarction before 1942, concluded that long-term survival was better than had been previously estimated, and that the implication of this finding in assessing new methods of treatment was obvious. In their series two-thirds of the patients were alive after five years, and a similar number were able to resume moderate or normal physical activity after recovery. Two-fifths of the patients were alive after ten years and one-tenth after fifteen years.

E. Bay,⁸ while accepting the value of anticoagulants, suggested that once the patient had survived his first myocardial infarction for two or three years and was still ambulatory, he had a considerably reduced chance of a recurrence; so that anticoagulants did not need to be continued after this period. J. Tulloch and I. S. Wright⁹ reported on the long-term treatment of 227 patients who had developed cardio-vascular thrombo-embolic phenomena. Anticoagulant therapy was maintained for up to eight years by means of dicoumarol or "Tromexan". Gross haemorrhage episodes were encountered in 43 out-patients, and there was one attributable death. Complete protection from thrombo-embolic phenomena was not obtained, and death due to myocardial infarction occurred in two cases in which patients had received regular anticoagulant therapy. More recently, R. Gilchrist and J. A. Tulloch¹⁰

¹ *Am. Heart J.*, December, 1948.

² *Acta med. scandinav.*, 146: 252, 1953.

³ *Am. J. M. Sc.*, 226: 607, 1953.

⁴ *Brit. M. J.*, April 25, 1953.

⁵ *Am. J. Med.*, June, 1953.

⁶ *Lancet*, January 9, 1954.

⁷ *Circulation*, March, 1954.

⁸ *Circulation*, May, 1954.

⁹ *Circulation*, June, 1954.

¹⁰ *Brit. M. J.*, September 25, 1954.

suggested that anticoagulants were of established value for the first six weeks after myocardial infarction, and they stressed the necessary precautions in this kind of therapy for the long-term out-patients.

A more recent evaluation of the effect of continuous long-term anticoagulant therapy on the prognosis of myocardial infarction is that of M. M. Suzman, H. D. Ruskin and B. Goldberg.¹ A series of 82 patients was treated continuously with anticoagulants for periods of from three to seventy-six months after the occurrence of myocardial infarction. Another 88 patients with a similar history acted as a control group and received anticoagulants only in the acute phase of recovery. Heparin was used initially after the infarction and was then replaced by either dicoumarol or phenylindandione. Control of the prothrombin level was maintained by testing every one or two weeks, and in the more stable patients at periods up to four weeks in length. The therapeutic level required was twice the normal prothrombin time. Of the patients, 70% were found to be stable in their needs of the anticoagulant, while 10% fluctuated constantly. Of those receiving the anticoagulants, nine patients developed hæmaturia, and one each epistaxis, melæna and hæmorrhoids. One patient died of cerebral hæmorrhage, and one died after massive gastro-intestinal bleeding. The only clearly statistical difference between the two groups was the higher incidence of previous myocardial infarction in the long-term treated patients. There were six deaths in the long-term group and 29 deaths in the control group. When the patients were divided into those in whom the presenting attack was mild or severe, the differences became more apparent. Death occurred in only one mild case out of the total of 43. In the severe cases death occurred within five years in 9% of the long-term patients and 46.7% of the control group. Neither sex nor age had any influence upon the prognosis. Subsequent myocardial infarction occurred in 8.5% of the long-term patients and 27.3% of the control patients, and death from this further episode occurred more frequently in the control group. Death due to cardiac failure was also more common among the control patients. Subsequent *angina pectoris* was equally common in the two groups, but there was some improvement of the condition, particularly in those patients receiving anticoagulants. The authors state that a fatal outcome was no more likely among those patients with a previous history of infarction and receiving anticoagulants than among patients with no previous history and not receiving long-term and anticoagulant therapy. The difference in mortality was particularly notable in those patients with a previous history of myocardial infarction. The conclusion to be drawn from this survey is that the chances of survival are particularly good in those patients in whom initial infarction is mild and who receive anticoagulants in the acute phase of recovery. For all other patients the use of anticoagulants in the acute stage of recovery after myocardial infarction is now well established.

However, A. M. Master and H. L. Jaffe,² in proposing a more active policy in the treatment of acute coronary occlusion, suggest that the routine use of anticoagulants is unnecessary. This therapy should be employed for patients with heart failure or shock and for those patients who develop peripheral phlebitis, peripheral arterial embolism or pulmonary embolism. The more optimistic view of the long-term prognosis is maintained by reports of studied series of cases. M. M. Weiss³ has found that the majority of patients who die after myocardial infarction do so in the first five years, and that one-third of them live for at least ten years. A. Gilchrist and J. A. Tulloch⁴ maintain that anticoagulants used in the acute stage of recovery after myocardial infarction halve the death rate over the first six weeks of hospital care, though in good risk patients the treatment need not persist for more than ten days. These authors are still cautious in predicting the good effects of long-term anticoagulant therapy. They

suggest that such treatment under good conditions is probably justifiable in the prevention of thrombo-embolic episodes in the peripheral venous system and in the pulmonary circulation. Experience based on 248 post-mortem examinations does not support the claim that anticoagulants are responsible for a significant reduction in the incidence either of intraventricular thrombi or of peripheral arterial infarcts.

The ultimate problem of control is not unlike that of *diabetes mellitus*. The correct dosage of anticoagulant is precise and individual. The search must continue for a drug which is longer lasting, more easy to control and safer.

ALDOSTERONE.

The grouping of the steroid compounds secreted by the adrenal cortex into mineralocorticoids and glucocorticoids is convenient if not final. The glucocorticoids, which are concerned particularly with carbohydrate and protein metabolism, have been extensively studied, both clinically and in the laboratory, in the last twenty years. Of the mineralocorticoids, which are concerned with water and electrolyte metabolism, most interest has been shown in aldosterone, a naturally occurring steroid isolated in 1952 by J. F. Tait, S. A. Simpson and H. M. Grundy,¹ and subsequently crystallized and chemically identified as 18-aldehydo-corticosterone. It was apparently this substance which was detected but not isolated in 1950 by Q. B. Deming and J. A. Luetscher, junior, who found strong sodium-retaining activity in lipid extracts of urine from patients with nephrosis and congestive heart failure. In a recent discussion on aldosterone Luetscher and R. H. Curtis² point out that this steroid is more than thirty times as potent as the synthetic substance desoxycorticosterone in reducing sodium excretion and has a comparable effect in increasing the output of potassium. In excess, it has some properties of the glucocorticoids such as corticosterone or hydrocortisone. It has been used successfully for brief periods in the treatment of Addison's disease. Larger amounts given to a few patients with other diseases have caused sodium retention and oedema. However, it has not been available in sufficient quantities so far for anything like extensive clinical trial.

Luetscher and Curtis have carried out a series of studies on the excretion of aldosterone in the urine, and from their data and the observations of others are able to make certain general statements. Their findings indicate that there is a close correlation between aldosterone output and electrolyte balance in man. In normal man it plays a part in renal adjustment to changes in electrolyte balance. This adaptation is impaired in the presence of primary and renal insufficiency. Removal of the pituitary gland does not necessarily result in loss of this capacity, and it has been found that the aldosterone output may be increased during sodium deprivation in a patient who has undergone hypophysectomy. In cases of adreno-genital syndrome and Cushing's syndrome the output of aldosterone is usually not far from normal. Aldosterone output is increased in various circumstances: first, in normal men receiving diets low in sodium or high in potassium content; second, in patients with nephrotic syndrome, congestive heart failure, hepatic cirrhosis or toxæmia of pregnancy during periods of exacerbation and accumulation of oedema (in these cases effective treatment and improvement of the underlying condition result in reduced aldosterone output and diuresis); third, in patients with tumours of the adrenal cortex which secrete aldosterone. This last-mentioned condition, to which particular reference has been made by J. W. Conn,³ is of considerable interest. Luetscher and Curtis state that the patients affected with adrenal cortical tumours of this type have hypocalcæmia, alkalosis and

¹ *Circulation*, September, 1955.

² *Dis. Chest*, January, 1956.

³ *Am. J. M. Sc.*, January, 1956.

⁴ *Scottish M. J.*, January, 1956.

¹ *Lancet*, January 19, 1952.

² *Ann. Int. Med.*, October, 1955.

³ *J. Lab. & Clin. Med.*, January, 1955.

hypernatremia, which are manifested clinically as severe muscular weakness, periodic paralysis, tetany resistant to calcium therapy, hypertension, little or no oedema, and signs of mild chronic renal insufficiency. Some similar cases have been previously described as "potassium-losing nephritis", but it is now considered that they were also cases of "primary hyperaldosteronism". It is further stated that when an excess of aldosterone appears in a patient with heart disease, the nephrotic syndrome, hepatic cirrhosis or toxæmia of pregnancy, the initial effect on the kidney is retention of sodium, and the accumulation of oedema is favoured by the disturbed capillary equilibrium. In this case the high output of aldosterone is secondary to the presence of other disease, and the effects of the hormone may be modified by changes in the kidneys and in other tissues. Aldosterone does not show its usual effects when the kidneys fail to respond. In a case of "sodium-losing nephritis" Luetscher and Curtis found that a high output of aldosterone was associated with dehydration and loss of sodium in the urine. Later the output of aldosterone fell to normal in this patient, when a very high sodium intake resulted in improved hydration, with a very high daily excretion of sodium.

LEONARDO DA VINCI AS ANATOMIST AND PHYSIOLOGIST.

In 1952 throughout the civilized world there was celebrated the quinque-centenary anniversary of Leonardo's birth, and many glowing tributes were paid to his versatile and outstanding genius. Leonardo's preeminence as an artist remains unchallenged and deserves all the praise bestowed; but unfortunately many of his admirers, carried away by their enthusiasm, have written of him as a great engineer and man of science, and these attributes can be challenged. The late Lord Halsbury gave us the aphorism "whatever you exaggerate you weaken", and the uncritical adulation showered on Leonardo is liable to do harm to the memory of so wonderful a man. There is always a temptation to promote a peerless master in one field of human endeavour into a sort of *πανόπτης*. Literary admirers of Goethe often speak with bated breath about his contributions to science, an attitude which the late Sir Charles Sherrington refused to accept. Shakespeare enthusiasts sometimes claim that the great poet and dramatist anticipated Harvey in describing the circulation of the blood and that he was a naturalist who never made a mistake. The repute of Shakespeare and of Goethe do not need these exotic accretions. In justice to those who have extolled Leonardo for his creative ability in other realms than art it should in fairness be mentioned that he displayed a restless curiosity concerning the world around him backed up by a powerful intellect. Taking one department of science which appealed strongly to Leonardo, we may ask what contributions of note he made to anatomy and physiology. This question has been very ably handled by an American medical historian, J. B. de C. M. Saunders,¹ who is a great admirer of Leonardo, but is capable of examining the claims to biological distinction with detached calmness and complete absence of bias. Here are some of the more important conclusions. They are in curious contrast to the views expressed recently by Elmer Belt in his Logan Clendening Lectures, discussed in these columns in the issue of March 31, 1956.

Leonardo did not break with tradition, nor did he flout orthodoxy in belief. "To the end of his days Leonardo carried an oppressive load of barren learning and authoritative error which time and time again diverted him when his approach would seem to have brought him to the very brink of a major discovery." His reverence for the written word was deep. Often and often did he make drawings of an organ not as it was but as it ought to be were it carrying out the function it was supposed to perform. Thus respecting the circulation he upheld Galen's idea of blood tides ebbing and flowing throughout the body and of the distribution of the various humours, and modified his

drawings accordingly. The Galenical hypothesis of blood passing through pores in the interventricular septum he upheld, so that Harvey later had to oppose not only Galen but Leonardo.

A hardship which faced Leonardo was the limited opportunity to dissect the human body; during his Roman period this was strictly forbidden. We know that he dissected a human head and a human leg, but his practical knowledge of anatomy was gained from the butcher's shop and from monkey and dog. Leonardo did not hesitate to make a distorted drawing of a monkey's bone and place this in a sketch of a dissected human limb. In a representation of the human neck the larynx is obviously that of a lower animal; the same may be said of the kidneys and the arch of the aorta. His famous gravid uterus of a woman shows the placenta of an ungulate. It is strange that Saunders does not mention Leonardo's ideas concerning vision. According to him something emanated from the eye and struck the object viewed. His proofs of this are curious: a snake can attract a nightingale by its glance, a wolf by looking at a man can make him hoarse, a basilisk through its gaze can kill, ostriches and certain spiders can hatch their eggs by looking at them, a fish has eyes that glow in the dark, and as for the power of a girl's eyes over a man that is well known!

It is to be hoped that physicists and engineers will copy Saunders and submit Leonardo's shrewd conjectures and Jules Verne imaginings to a dispassionate criticism. He has been hailed as the inventor of the helicopter, but every flight engineer knows that no man, however vigorous, could raise his body in any form of helicopter operated by unaided muscular action. It is generally admitted that his exposition of the physics of falling bodies is unsound—that problem had to wait until Galileo, a true man of science. Still, when every criticism is made, there remains enough to recognize in Leonardo a genius in fields of effort outside that of art, where he was supreme.

COOL PATIENT AND PLASTER CAST.

PLASTER OF PARIS is heavy, cumbersome and an extraordinarily efficient white exoskeleton. Jackets, slabs and casts all provide rest for shattered limbs, spine and muscles, and they maintain good stable position during the healing after orthopaedic operations. The disadvantages of weight and rapid destruction when it is damp are, from the point of view of the patient, overshadowed by the capacity of plaster of Paris to act as an efficient thermal insulator. It conducts heat very poorly, and the cast prevents cooling by convection. In warm weather even a small cast may be very uncomfortable, and a large cast, when properly fitting, may be quite intolerable. For children, in whom the temperature control is at the best easily upset, the discomfort of the hot damp flesh itching and burning inside the hard intractable blanket of plaster results in genuine and understandable physiological and secondary mental distress.

C. R. Sullivan² describes a method of cooling large plaster casts by a comparatively simple method. This consists in the winding around the body of turns of continuous rubber tubing one and a half to two inches apart. The tubing is of the ordinary one-quarter inch laboratory type and is applied over the first layer of three or four thicknesses of plaster bandage. The rest of the cast is then built on top. The projecting tubing is of suitable length for connexion to a refrigerated water supply, such as the faucet of a cool water drinking fountain. The cold water, when run into the system, can be held with the tube clamped at either end leaving the patient lying neatly dry and cool in his own private eathenware jug. Obviously care is necessary in applying the tube, as any blocking kinks are irremovable once the plaster is set. The system is so apparent and simple that it may well be already employed. However, it is well worth noting as a possible contribution to the well-being of the patient.

¹ Texas Rep. Biol. & Med. (1955), 13: 1010.

² Proc. Staff Meet. Mayo Clin., November 16, 1955.

Abstracts from Medical Literature.

PHYSIOLOGY.

Inhibition of Gastric Motility by Acid in the Duodenum.

H. SCHAPIRO AND E. R. WOODWARD (*J. Appl. Physiol.*, July, 1955) state that the presence of acid in the duodenum inhibits gastric motility in the human subject as well as in the experimental animal. The proximal part of the jejunum is also capable of initiating this response, while the lower part of the intestinal tract is ineffective. The brief latent period of this inhibitory effect suggests the presence of a reflex action; however, the phenomenon persists after vagotomy, sympathectomy, transection of the gut wall or spinal cord transection.

Accuracy of Thermocouples as Surface Thermometers.

G. K. STILLWELL, A. HEMINGWAY AND F. J. KOTKE (*J. Appl. Physiol.*, September, 1955) report that the accuracy of thermocouples as surface thermometers, when fastened to the surface by adhesive tape, has been assessed. The temperature of the surface, as measured by a thermopile, was used for the standard of comparison. The minimal error of the thermocouples was 0.1° C. when the difference in temperature between the surface and its surroundings (the "cooling gradient") was less than 1° C. As this gradient increased from 0° C. to about 6° C., the thermocouples reported temperatures progressively lower than temperatures recorded radiometrically. On a copper surface covered by a layer of flat black paint, thermocouples, covered by one layer of adhesive tape, read about 0.4° C. less than the radiometric temperature when the cooling gradient was 6° C. This error was approximately doubled when the surface was that of a layer of rubber, 0.035 centimetre in thickness, backed by a copper plate. It reached a value of about 1° C. when the surface was that of a piece of rubber 0.2 centimetre in thickness. As the cooling gradient increased beyond 8° C., the error of the thermocouple tended to return toward zero. It appeared likely that thermocouples would read too high instead of too low when the cooling gradient exceeded 10° C. The effect of varying the size of the wires from which the thermocouples were made is reported, as is the effect of varying the number of layers of adhesive tape by which the thermocouples were fastened to the surface. Possible explanations for these effects are presented.

Distribution of Inspired Air in the Lungs.

A. ROOS, H. DARLSTROM AND J. P. MURPHY (*J. Appl. Physiol.*, May, 1955) describe experiments concerning air distribution in the lung. Using the technique of continuous analysis of expired nitrogen concentration after inspiration of oxygen in one or a series of breaths by normal and emphysematous subjects, they made a study (i) of the meaning of the

respiratory dead space, as measured by this method, and (ii) of the influence of the time course of the respiratory cycle and of certain other factors upon both the volume of the respiratory dead space and the incorporation of fresh gas into the alveolar air content of the lung. The difficulty in establishing a definite criterion for the first appearance of pure alveolar gas is demonstrated. Possibilities are discussed as to the nature of the transitional zone, between gas from the conducting airways and from the alveoli proper. The importance is shown of diffusion for the reduction of the respiratory dead space which results either from prolonging expiration time or from establishing an inspiratory pause. Similarly, the significance of intra-alveolar diffusion for alveolar ventilation is quantitatively demonstrated by means of studies during breath-holding, slow expiration, and moderate and extreme tachypnoea. As much as 200 cubic centimetres of the inspired air may be incorporated into the alveolar gas by means of diffusion. Evidence is given that some lung regions may exchange with the rest of the lungs solely through diffusion. Finally, reasons are given why so-called "stratified inhomogeneity" of alveolar composition may well play a significant part in the unevenness of lung ventilation.

Gastric Inhibition of the Drinking Response.

A. V. MONTGOMERY AND J. H. HOLMES (*Am. J. Physiol.*, August, 1955) report that in the dog, either water introduced into the stomach or balloon distension of the stomach, twenty to forty minutes prior to injection by the intravenous route of 20% sodium chloride solution, greatly inhibits the drinking response which is usually observed after salt injection. Such inhibition does not occur when these procedures are carried out within five minutes of the salt injection. If the balloon is inflated forty minutes prior to salt injection and is then deflated at the time of salt injection, the drinking is delayed for periods of up to one hour. Cocainization of the stomach effectively abolishes the inhibition caused by balloon distension. Pressure measurements in the stomach indicate that there is a significant and comparable increase following either balloon distension or the introduction of water. Prior application of cocaine to the gastric mucosa abolishes these pressure changes. Introduction of water into the rectum thirty or forty minutes prior to salt injection also inhibits drinking, though to a lesser extent than when water is introduced into the stomach. The relationship of these factors to an integrated concept of the satisfaction of thirst is discussed.

The Physiological Stimulus of Shivering.

T. R. A. DAVIS AND J. MAYER (*Am. J. Physiol.*, June, 1955) describe the application of two physiological tools to the study of shivering. These were imperfectly homotheurmic mice and electromagnetic waves, substituting for chemical thermogenesis previously described. A description is given of the progressional characteristics of shivering as recorded

by the electromyograph, together with a redefinition based on the progression from inapparent to apparent bursts of reflex muscular activity in relation to time of exposure. Shivering was studied in euthermic, hyperthermic, hypothermic and deeply hypothermic animals. In all conditions, except non-physiological deep hypothermia, it was found that the difference between the central and the mean surface temperatures was the factor determining the occurrence, intensity and evolution of shivering. The rapidity of changes in reflex muscular activity following changes in the difference between central temperature and the temperature of end-organs in the skin suggests that the resulting responses admit exclusively of a neurological mediation.

Effects of Hypothermia Induced by Blood Refrigeration.

C. H. W. RUEH AND R. H. HORN (*Am. J. Physiol.*, August, 1955) have studied the circulatory and respiratory reactions of rabbits cooled by blood refrigeration. Quantitative differences in response were produced by shifting the returning cold blood from the heart to the head. Animals in which the head received the cold blood first died with significantly higher heart and rectal temperatures than those in which the heart received the cold blood first. The probable cause of death in both groups was failure of respiration, which occurred at a brain temperature of approximately 16° C. The nature of the deterioration and of the dissociation of respiration indicated that there was differential depression of the respiratory centre. Blood pressure responses differed with a change in the area of primary cooling. Electrocardiographic variations were directly related to heart temperatures. Rectal temperatures were an unreliable index of the hypothermic state, since they differed greatly from brain and heart temperatures, particularly at low temperature levels.

Thermal Properties of Fur.

H. T. HAMMEL (*Am. J. Physiol.*, August, 1955) describes how the guarded hot-plate method has been adapted for measuring the thermal insulation of fresh, dried and tanned furs of 15 species of northern mammals. The degree of insulation per unit thickness of the inner level of fur was obtained by measuring the temperature gradient in the fur through which a known quantity of heat was flowing. The guarded hot plate provided the heat, and the temperature gradient was measured with a ladder-like array of fine wire thermocouples inserted into the fur with all wires running parallel to the skin. The average value of the insulation, per unit thickness, of the inner fur of fresh pelts from ten species of northern mammals was 4.2 clo per inch (1.1×10^4 square centimetres per second per degree Centigrade/calories per centimetre). This value is representative within $\pm 10\%$. The highest total insulation obtained was seven clo (tanned coyote), and several pelts had total insulation values above six clo. The insulation provided by fur is influenced by the temperature of the air pervading the fur. The effect is about a 1%

increase in insulation per unit thickness for each degree Centigrade by which the temperature is lowered. Fresh pelts have a lower insulation per unit thickness than dry or tanned furs, and this probably means that some heat is lost in the former by evaporation of water. Erection of the hairs in furs and pelts had the effect of raising the total insulation, but lowered the insulation per unit thickness of the inner layers. The conductivity of fur was decreased by about fourfold, by replacing the air in and around the fur with the common refrigerant gas "Freon". Since this is close to the ratio of conductivities of still air and "Freon" (2.66) multiplied by a factor which accounts for the fact that "Freon" did not transfer heat by convection (the factor is equal to the ratio of the conductivities of fur in air and still air), the major avenues for heat transfer through dry pelts, with air pervading the fur, must be by air conduction and by the natural convection of the entrapped air. Heat conduction by the fur fibres and radiation transfer are negligible. Three experimental pile fabrics made to simulate fur were tested, and the insulation per unit thickness of the best sample tested was only 3.0 clo per inch.

BIOCHEMISTRY.

Protein Synthesis.

M. V. SIMPSON (*J. Biol. Chem.*, September, 1955) has studied the incorporation of labelled amino acids into muscle aldolase and glyceraldehyde-3-phosphate dehydrogenase in the intact rabbit with intervals of thirty minutes between the injection of the amino acids and the sacrifice of the animal. This interval is shorter than any hitherto used in such experiments, either *in vivo* or *in vitro*. The pattern of labelling indicated that in each of these two proteins a given amino acid is equally labelled in whatever position it occurs in the protein molecule.

Estradiol.

C. A. VILLEE and E. GORDON (*J. Biol. Chem.*, September, 1955) have carried out experiments in which particulate-free enzyme preparations of human placenta are used. These have provided evidence that estradiol stimulates a DPN-linked iso-citric dehydrogenase. Estradiol increases α -ketoglutarate production from citrate, *cis*-aconitate or iso-citrate, but not from oxalosuccinate.

Squalene.

A. A. KANDUTSCH and C. A. BAUMANN (*Arch. Biochem.*, June, 1955) have demonstrated that the application of squalene to the skins of young mice increased the concentration of both Δ^7 -cholesterol and cholesterol in the epidermis. The relative increase in Δ^7 -cholesterol was greater than that in cholesterol, resulting in much higher concentrations of Δ^7 -cholesterol in the sterol mixture of the treated mice. The skins of older mice, which normally contain the highest concentration of Δ^7 -cholesterol, were less

sensitive to squalene than those of young mice. Dietary squalene fed at a level of 1% of the basal diet did not increase the concentration of Δ^7 -cholesterol in the livers of rats or mice.

Intestinal Absorption.

L. FRIDHANDER and J. H. QUASTEL (*Arch. Biochem.*, June, 1955) have studied absorption from the guinea-pig intestine. The rate of fructose absorption from the isolated surviving intestine, when the lumen of this is perfused with a fructose solution, increases with increase of concentration of fructose. A limiting value for fructose absorption, however, is reached. This phenomenon of a limiting rate of sugar absorption is shown not only by fructose but by sorbose and sucrose. The rate of glucose appearance on the serosal aspect of the intestine exceeds that of fructose, at low concentrations of fructose in the mucosal solution, and is less than that of fructose at high concentrations of fructose in the mucosal solution. The presence of anaerobic conditions, or that of 2,4-dinitrophenol under aerobic conditions, suppresses glucose formation from fructose in the isolated intestine, but has no influence on the rate of absorption of fructose. The presence of phlorizin suppresses "active" glucose absorption from the intestine, but at the concentrations investigated has no effect on the rate of fructose absorption or on glucose formation from fructose. The results conform with the conclusion that there is no "active" absorption of fructose and that glucose formation from fructose in the intestine is enzymically controlled. Sucrose is absorbed "passively" by the isolated intestine, its rate of absorption being unaffected by anaerobic conditions. The presence of phlorizin has no effect on the rate of absorption of sucrose, but it suppresses the rate of glucose appearance. Substitution of sucrose by an equimolar concentration of invert sugar has no significant effect on the rates at which glucose and fructose appear on the serosal side of the intestine, whether the conditions are aerobic or anaerobic. It is concluded that hydrolysis of the sucrose occurs after its entry into the intestinal tissue. The L-isomers of histidine and alanine are absorbed at a more rapid rate than the respective D-isomers from the isolated surviving guinea-pig intestine. Increase of concentration of DL-alanine above 0.01M results in a progressively smaller increment in rate of absorption. Above 0.02M the increase in absorption is probably due to increase in the amount of diffusion and not to increase in "active" absorption. Anaerobiosis diminishes absorption of DL-alanine. The presence of 10^{-4} M dinitrophenol diminishes the rate of active absorption of both DL-alanine and L-phenylalanine. The presence of phlorizin does not inhibit the active absorption of either DL-alanine or L-phenylalanine from the isolated surviving guinea-pig intestine. The presence of 0.01M deoxyypyridoxine inhibits the absorption of DL-alanine from isolated surviving guinea-pig intestine. The presence of 10^{-3} M deoxyypyridoxine also inhibits the active absorption of glucose and fructose, pointing to an inhibitory action of deoxyypyridoxine on

the mechanisms underlying "active" absorption in general from the isolated intestine. A high concentration of glucose (0.278M) inhibits the absorption of DL-alanine. This effect is likely to be due to osmotic effects, as sorbose at the same concentration has a similar inhibitory effect. High concentrations of sodium chloride in the lumen are inhibitory to amino acid absorption.

Tumour Metabolism.

P. J. FODER *et alii* (*Arch. Biochem.*, June, 1955) have shown that in contrast to non-regressing tumours, the spontaneously regressing Flexner-Jobling carcinoma changes its enzymatic pattern in the course of regression. Catheptic activity was found to increase considerably. On the other hand, the level of alkaline phosphatase in regressing tumours is greatly decreased. There is also a tendency towards lower alkaline phosphatase levels in the first ten days after transplantation. Alkaline phosphatase activity thus seems to go through a maximum: it is low in the first ten days of tumour growth, it reaches its highest activity after the first ten days' interval, and in the course of regression it is again reduced to low levels. The increase in catheptic activity in the course of tumour regression has been tentatively interpreted as an enzymatic equilibrium shift from protein synthesis to hydrolysis, an autolysis *in vivo*, concerned with the splitting and subsequent removal of the tumour proteins.

Manganese.

L. S. MAYNARD and G. C. COTZIAS (*J. Biol. Chem.*, May, 1955) have reported that intraperitoneally injected radioactive manganese (Mn^{54}) is rapidly distributed, being concentrated primarily in organs rich in mitochondria. Liver cell fractionation studies confirm the assumption that the mitochondria are the principal intracellular sites of manganese uptake. The observed distribution of manganese would be compatible with its functioning as a respiratory cofactor.

Iodide.

M. MIDDLEBROOK and A. SZENT-GYORGYI (*Biochim. et biophys. acta*, November, 1955) have compared the action of dinitrophenol, thyroxine and iodide on oxidative phosphorylation in liver mitochondria. They found that in relatively low concentration iodide uncoupled oxidative phosphorylation, suppressing completely the formation of energy-rich phosphate compounds without inhibiting oxidation. Thus iodide is similar in this respect to thyroxine itself.

Steroids.

H. H. WOTIZ *et alii* (*J. Biol. Chem.*, October, 1955) have shown that incubation of surviving tissues from an embryonal tumour of the testes with $1-C^{14}$ -acetate resulted in the isolation of radioactive testosterone, androstenedione, progesterone, estradiol and estrone. Pregnane diol assays on post-operative urine specimens in the presence of known metastatic disease yielded higher than normal amounts of this steroid.

On The Periphery.

OF GARDENS AND PHYSIC.

To travel to London from the country daily by train is to learn much of the manners and customs of the country—and of nothing so much as gardening. Particularly on Mondays, tales of mystery and perhaps of imagination are told with a solemnity more befitting cricket or affairs of state than such a humble, earthy subject; it is clear that the cult of the garden has its roots firmly embedded in the hearts of the most urban of Englishmen. From the train window may be seen the temples, the glasshouses and potting-sheds in their infinite variety of shapes and sizes, flourishing in profusion in the succession of narrow rectangular plots neatly aligned at right angles to the railway line. Simple ones, elaborate ones, flamboyant ones and shy retiring ones, their varied architectural styles impart almost the only flash of individuality to row upon row of sad terraced houses in their coats of grey smoke. There the rusting air-raid shelter, the broken window pane, the disused double bed, and a host of other strange items find honourable retirement. Perhaps nowhere else would such devotion and enthusiasm be given, in flagrant defiance of the elements and the atmosphere, to what is for most people a pastime.

Roman England had its gardens, but succeeding centuries saw little opportunity for such settled pursuits prior to the rise of the mediæval monasteries. In the comparative peace of its high walls each monastery developed a garden, and each garden devoted certain plots to the growing of culinary and medicinal herbs. The monks' use of simples, folk-lore, the doctrine of signatures and the learned herbals, such as the *De Materia Medica* of Dioscorides (A.D. 512), all contributed to the development of orthodox therapeutics. Later influences, such as those exerted by the new science of botany, contact with exotic plants from India and America, the significant discoveries of foxglove and cinchona, as well as certain sharp commercial practices by unscrupulous apothecaries, led to the need for gardens specializing in medical botany, for botanical or physic gardens. As early as the fourteenth century there was a medicinal herb garden at Salerno, but the first botanical garden in the modern sense was established at Padua in 1545, two years after the publication of Vesalius's *De Humani Corporis Fabrica*. Others followed at Bologna and Paris. In Germany during this century the superbly illustrated herbals of Leonhard Fuchs and Otto Brunfels were published, while in England the first printed English herbals were soon followed by the more elaborate works of William Turner and John Gerard, and later by Culpepper's popular herbal. In London at about this time Gerard superintended a garden for the Royal College of Physicians near Saint Paul's, and grew a thousand different plants in his own garden at Holborn (not far, indeed, from the Barber Surgeons' herb garden in Monkwell Street). Wild bugloss flourished on the ditch banks of "Pickadilla" (probably nearer to Trafalgar Square than the modern Piccadilly), marigolds in Paddington and belladonna in the fields at Islington; but even a century and a half later Linnaeus is reputed to have fallen to his knees in admiration of the gorse in flower on Putney Heath. In 1621 the first English physic garden (physic, or physical, as DREWITT points out, implied natural or scientific rather than pertaining to drugs) was formed at Oxford. On the north bank of the Isis it still forms part of the picturesque scene by Magdalen Bridge, although much changed as a result of the scientific classification and orderly arrangement of the plants.

During the eighteenth century, in addition to such institutions as the Royal Gardens at Kew, there arose a number of remarkable private gardens and botanical collections. Particularly noteworthy were two belonging to the Quaker physicians, John Fothergill and his pupil, John Coakley Lettson. Fothergill's garden at Upton, in Essex, became part of West Ham public park in 1874. The house has gone, but there remains an old maidenhair tree, the trunk of which is flattened where it stood against one wall. Many of the present trees were possibly planted in Fothergill's day, but there is, of course, no trace of the hundred or so exotic plants which he introduced to England. Close by the park stands the house in which Lord Lister was born. Lettson, who lived at one time off Fleet Street by Dr. Johnson's house, developed his elaborate garden at Camberwell, "a pretty village" four miles south of the city, then commanding a magnificent view of the river. Here he transferred many of Fothergill's more valuable plants on the latter's death. The "pretty village" is now one of those sombre inner suburbs which have so plainly known better

days, but with the help of the excellent description in Abraham's biography of Lettson the boundaries of the ten-acre property and some of its landmarks may still be identified. There are more important parallels in the lives of the two prominent Quaker physicians, but it is of interest here to note that Lettson gained his M.D. at Leyden for a treatise on the medicinal properties of tea; Fothergill, who had been amongst the first in Europe to get the tea tree to flower, wrote a paper on coffee. One of the many controversies in which Lettson was involved—and which make Abraham's "Life" so valuable a contribution to the medical history of the period—stemmed from his enthusiastic advocacy of mangel-wurzel, which he had grown at Camberwell, as an article of diet.

One garden not only has survived the growth of the city all around it, but has managed to preserve an old-world air of quiet dignity within easy walking distance of Vauxhall Bridge. It is situated in Chelsea, and is probably passed, unnoticed, by thousands of tourists hurriedly seeking the former homes of men such as Whistler, Turner, Meredith, Rossetti, Swinburne, Eliot and Carlyle. Close by is what remains of the residence of Sir Thomas More, whose chapel has been restored in the rebuilt Chelsea Old Church; very close is Sir Christopher Wren's Chelsea Hospital, the grounds of which once formed the fashionable Ranelagh Gardens. The eastern boundary of the garden is formed by Swan Walk; where this joins the Embankment was the site of the Swan Tavern to which Mr. Pepys occasionally repaired. A little way along the Walk, towards Royal Hospital Road, is a small gate set in the high brick wall. Beside it is inscribed "Hortus Botanicus Societatis Pharmacuticæ Lond. 1686". The site of the Apothecaries' Garden was leased from Lord Cheyne in 1673; in 1722 the land was made over to the Society of Apothecaries on certain conditions by Sir Hans Sloane, sometime President of the Royal College of Physicians and the virtual founder of the British Museum. At the end of the last century, having outlived its usefulness to the medical profession, the garden became the responsibility of a committee of management composed of representatives of various bodies interested in the preservation of a scientific garden close to the city.

The history of the garden has been delightfully recorded by Dr. F. Dawtrey Drewitt, and he also discusses, with an erudition quite beyond the humble botanical knowledge of the present writer, a number of the trees and shrubs which have survived two or even three centuries of London's polluted atmosphere (smoke is not new to the city; a diarist of 1769 recorded that "London, from an eminence near Highgate, presented itself to our view covered with a thick cloud of smoke"). Among the most picturesque are an old twisted mulberry tree and a venerable persimmon. The two cedars of Lebanon which grew by the wrought iron gates on the Embankment were familiar signs to Londoners for over two centuries, but the last one succumbed a little over fifty years ago. By the south-east corner are tall oak trees of indefinite age; behind them lies the barge-house. The original barge-house, built in 1673, was destroyed by enemy action in 1941, but a reconstruction of it was completed in 1954. Although once it stood by the entrance of a creek into the Thames, it is now well back from the river because of the Embankment, the construction of which added several yards to the southern limit of the garden in 1874. Near the centre of the garden is the rockery, based upon lava which Sir Joseph Banks brought back from Iceland. Indeed, the garden was much indebted to Sir Joseph; both he and Dr. Solander saw to it that the Apothecaries' Garden received specimens which came from Botany Bay.

The garden is now laid out to illustrate the science of botany, and it is strange that it should somehow contrive to represent a period now long past. Certainly the impression is not due to the single bed devoted to medicinal plants as an indication of the garden's former associations and function. In this bed, incidentally, the modern student may identify, at least by name, digitalis, belladonna, chenopodium, helleborus, mentha piperita and aconite. More likely the illusion is due to the central dominating figure of Sir Hans Sloane, in the robes of the President of the Royal College of Physicians; the magnificent statue, elegantly posed, is visible from all parts of the garden. It is difficult to believe that, little more than half a century ago, this oasis of quiet and green in a wilderness of noise and grey stone would have been visible, had it not been for the tall trees of Chelsea Park, from the Hospital for Consumption at Brompton a mile or more away.

Mention of Sir Joseph Banks recalls the collection of specimens made by Banks and Solander and housed at the National Herbarium in the Natural History Museum at Kensington. Some of the catalogue exists in Solander's own

hand, and the collection includes many Australian items. Another link with Australia preserved in this museum is the diary of Robert Brown for the years 1801 to 1805, unfortunately incomplete and almost indecipherable. The Brown correspondence includes some letters, of relatively minor importance, from men such as W. S. Macleay, E. Grey and J. E. Bicheno in Australia. One is from J. F. Palmer, a future Premier of Victoria, seeking Brown's help in locating any correspondence between John Hunter and Banks which might be useful to Palmer in preparing his edition of Hunter's works.

Perhaps we may conclude by reviewing the scope of the garden's contribution to physic, for it remains fundamental in spite of the development of chemical methods of drug production. This may be done by reference to the exhibits of medical interest in one of the museums at Kew Gardens. About a hundred items of greater or lesser therapeutic reputation are displayed, the list including approximately fifty substances which remained in common use until very recent times. For the bowels, aloes, jalap, cascara, castor oil and rhubarb; for the chest, ipecacuanha, squills, senega, eucalyptus and stramonium; for more specific complaints, digitalis, cinchona and colchicine; for various other purposes, with faintly sinister names, hemlock, henbane, monkshood, deadly nightshade, opium, Indian hemp and curare; all are there, one hopes to stay, even when their therapeutic use is more a matter of history than it is today. It is interesting to learn that valerian was once prized as a perfume, and to find that mandrake can really bear a remarkable resemblance to a human body. Interesting, too, are the wicker-covered earthenware jars which travelled to South America from Spain filled with wine and returned to Europe full of balsam of Peru. Among a series of Egyptian botanical relics are funeral wreaths from the tomb of Rameses II, but unfortunately only a picture of a garland from the tomb of Amenhotep. Finally, the exhibits relating to snuff and tobacco, snuff-boxes and pipes, are not without medical significance.

It is a far cry from the back gardens of suburbia, through the physic gardens of the past, to the herbaria and botanic gardens of the present, but the contrast is no greater than that offered by a walk from Westminster to the "Hortus Botanicus" of Chelsea.

BRYAN GANDEVIA.

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The Royal College of Obstetricians and Gynaecologists.

NEW SOUTH WALES STATE COMMITTEE.

A MEETING of the New South Wales Fellows and Members of the Royal College of Obstetricians and Gynaecologists was held on May 25, 1955, at Sydney.

Central Genital Cancer Registry.

DR. K. A. MCGARRITY read a paper entitled "Registration of Female Genital Cancer in Australia" (see page 641).

DR. EWAN SUSSMAN explained the evolution of the pro-forma from its first rough draft to its present layout. He said that when it was given a trial in a busy follow-up cancer clinic, earlier arrangements of the booklet had been found equivocal or not sufficiently comprehensive. With the pro-forma in its present form, the gynaecologist could record quickly and thoroughly, by placing ticks in the appropriate squares, the following data: extragenital and genital history and examinations, diagnosis, staging, treatment, and special investigations. This rendered this large volume of information susceptible to the punch-card system of sorting and extraction. In addition, adequate space was provided for recording operative details, and histopathological or post-mortem findings. A simple follow-up sheet concluded the pro-forma. To help uniform cancer staging, notes had been appended explaining the international staging of all types of genital cancer.

DR. W. G. MCBRIDE, the Superintendent of the Women's Hospital, Crown Street, Sydney, said that he considered the

pro-forma would make a very good clinical history record for patients with malignant disease examined at the cancer follow-up clinic at the hospital. If the booklet was made out in duplicate, one copy could be kept by the hospital, and one forwarded to the Registrar of the Genital Cancer Registry. Unfortunately, when one looked back at the records of the Women's Hospital, which had been taken by the resident medical officers, all of whom had had two or more years' experience in hospitals, one found that the records of malignant diseases were usually incomplete. That was because many of the residents were lacking in gynaecological experience, and at the time did not know the relevant questions to ask the patients. Thus, when one looked over their old records, it was very difficult to find all the information that was required. However, if the questions were set out for the resident, it would be much better for the follow-up investigation of the patient. It would not be difficult for the resident to check the history and then make a duplicate copy to send to the Registrar. It would then take the resident forty-five minutes to complete the history in the booklet, and then another fifteen to twenty minutes to make a duplicate copy to forward to the Registrar. Dr. McBride said that it was thought at his hospital that if that was done, the standard of clinical histories would greatly improve, and they would be of much greater value for the hospital's follow-up investigation of its patients.

DR. MALCOLM STENING said he thought that the establishment of a genital cancer registry was an excellent form of investigation and research, and the College was undertaking a worthwhile proposition. There was no suggestion that the pro-formas should take the place of existing methods of recording histories or cancer statistics in hospitals where that had been done for many years. The difficulty would be the accurate recording of statistics and the notification of all cases, and to that end it was hoped that all teaching hospitals would cooperate.

DR. A. A. MOON said that Dr. McGarrity should be congratulated on his efforts over a long period of time to establish a comprehensive cancer registry in Australia under the control of the Royal College of Obstetricians and Gynaecologists. A Commonwealth registry such as that would be a big improvement on hospital or State figures hitherto used in cancer studies. The necessary recording seemed formidable, but by the "ticking" system it had been found that an experienced resident medical officer could fill in the details in twenty minutes. It would appear that instead of curtailing the questionnaire, it might be necessary to make further additions in order that it should be comprehensive.

DR. G. CUMMINS said that he agreed entirely with the principle that a genital cancer registry should be established. He agreed also that the statistical data that would become available from such a registry would be of very great value to the medical profession.

DR. H. K. PORTER pointed out that for years the need for a cancer registry had been appreciated, but in spite of a great deal of preliminary work, it had never come to fruition. Now he was happy to be able to advise those present that at long last it was possible to say that the project had reached the launching stage. If valuable information about the numerous facts applicable to genital cancer was to be available, it would be through a registry such as was proposed that night. Everyone would quickly realize that some effort on someone's part would be required to complete the proposed pro-forma. That effort would have to come from those who were interested in and worked in genital cancer. If they did not actually do the work, they would have to superintend and supervise it. That meant that those men and women attached to the gynaecological departments at the larger hospitals—teaching and non-teaching—would be the ones concerned. Without that supervision on their part—more especially in the early months of the registry—the registry would not succeed. In short, everyone must give that work their attention, not only until the registry was established, but also after it had become something real. No doubt many useful suggestions would emerge from the meeting; but, if a pilot survey was decided upon, a good idea of the working of the scheme would be obtained. Finally, Dr. Porter paid a tribute to the work done by Dr. McGarrity, and pointed out that his sustained enthusiasm for a cancer registry was responsible for the scheme having progressed to the stage which made the meeting necessary.

The meeting then decided by a unanimous vote to adopt the registry in its present form, and to subject it to a period of one year's pilot survey, by concentrating on the teaching hospitals.

Out of the Past.

In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.

THE CLIMATE OF NEW SOUTH WALES.¹

[From "Two Years in New South Wales", by P. Cumingham, Surgeon, R.N., Third Edition, London, 1828.]²

THE extraordinary healthiness of the climate of New South Wales must be of no trifling importance, in the eyes of the European, considering how unhealthy most other new countries are. Intermittents, remittents, typhus, scarlet fever, smallpox, measles, whooping cough and croup are here unknown. Some few cases allied to remittent and continued fever have certainly been observed, but nothing decidedly of that nature. Dysentery is the most prevalent and fatal disease we have: yet deaths even from this cause are exceeding rare among the sober living portion of the community, and far from common even among the debauched, with whom dropsical affections are somewhat frequent as may be expected. Dyspeptic complaints are generally aggravated in the low warm portions of our country, but relieved by the free dry air of the uplands. Children are very subject to the teres or round worm so common in warm climates: and on reaching the age of puberty, phthisis is liable to supervene from the rapid sprouting out of our youths at this period: but the European phthisis is uniformly cured, or at least relieved by a removal hither, if early resorted to. An epidemic influenza carried off a number of the old Europeans some years ago and also not a few of the aborigines, while many of our younger individuals feel the effects of it to this day. It appeared at the time or immediately in the rear of a hot northern wind, the symptoms being violent headache, cough, sneezing, and inflamed eyes with a quick pulse and other general febrile concomitants. This year (1826) it has again fatally visited the colony. An inflammation of the eyes, "the blight", often follows, too, the same wind. The lower palpebrae are the chief seat of the disease, becoming red and swollen, and discharging a glutinous sort of matter which seals the eyelids together. The disease is attended also with a painful itching sensation which induces the patient to be constantly rubbing the eyes and thus increasing the symptoms. The winds that cause this ophthalmia occur about October and November—your April and May. They are often not unpleasantly warm at this time, but from their keen dry disagreeable feel somewhat resemble English easterly winds in the above spring months, and like them, too, are the winds that occasion our vegetable blights. This common disease is more troublesome than severe, being mild in its symptoms, and generally very easy remediable by shading from the sun and washing the eyes with a little weak goulard water. True syphilis among the whites, as far as I have heard, appears to be unknown: but gonorrhoea is exceedingly common and very virulent while it lasts, though always yielding readily to low diet, rest, and frequent ablutions.

Correspondence.

ESPERANTO OR INTERLINGUA?

SIR: There is in Sydney, New South Wales, a pioneer of a new medium for international science abstracts. He uses existing international/Latin terms and links them by ideographs. Some of the latter are already generally accepted and decipherable in all languages. This ideography has 100 meaning elements in diagrammatic or conventional form, reproducible by simple modifications of a typewriter. It is

¹ From the original in the Mitchell Library, Sydney.

² Cumingham made four voyages to New South Wales as Surgeon Superintendent of convict ships. He explains that he had resided two years, at occasional intervals, in the colony and travelled over a considerable portion of it. His book was written primarily to acquaint intending emigrants of the manner, pursuits and modes of thinking of the various classes resident in the colony; and of the justice of its laws and the wisdom of their administration.

based on the work of Ogden and Richards, authors of "The Meaning of Meaning" and of "Basic English" (an "inter-language" of 1000 words). The "grammar" of this "world writing" is an ingenious use of the logical categories obtained by semantic analysis of language. All terms are separated primarily into "photographic", "cinematographic" and "subjective" elements. Considerable self-discipline in thinking is needed to transcribe English into this "semantography", but this semantic self-discipline is an excellent check, so far not otherwise available, on those vague, ambiguous and often misleading phrases which blight scientific publications. Reading the symbols is a much simpler process and can be learnt in a few weeks, as against months (for efficiency) with Esperanto.

The charge of loss of "shades of meaning" can be directed against all systems of expression except one's mother tongue, unless one is a brilliant exponent of a foreign tongue which carries a rich cultural heritage. The more simple, clear, direct and objective the vehicle of expression, the more it will incur the wrath of those who insist on savouring the delicacies of high-flown subjective nuances. Scientific abstracts, however, should surrender these niceties if the choice is between them and ease of transfer of facts. Thus the Esperantist's plea ("Current Comment", M. J. AUSTRALIA, March 10) is hardly relevant. The "precision of style" claimed by Berlot for Esperanto is not "precision of sense", and is gained at the cost of multiplying difficulties for the learner. Zamenhof feared, like Bérliot, to turn national pride against his work if it used exclusively Latin roots, so he concocted a hotch-potch of European roots which affronts logic and is still as alien to the Afro-Asians as Latin would be. Where is the advantage in the Esperanto "birdo" for "bird" instead of the more widely recognized, simpler "avo"? But the biggest objection to Esperanto is the very one which makes Interlingua ("Latine sine flexione") preferred to Latin. Esperanto requires thousands of inflexions for a dubious gain in vocabulary economy. Admittedly this allows a less frequent use of particles. But all languages which succeed in practice as interlanguages are scantily inflected and make free use of particles—for example, pidgin dialects, Malay, Swahili.

Bliss symbols have the enormous advantage of being a logical extension of a process that is already going on around us in traffic signs, indicators on instrument controls *et cetera*—they are immediately translated into the mother idiom or even more directly into action. Bertrand Russell interviewed Bliss in Australia and wrote that any person financing publication of this *symbols universals*, which Leibnitz prophesied three hundred years ago, would perform "an important service for mankind". Bliss is always pleased to send cyclostyled examples of applications of his work to medical men for a few pence or a few shillings (cost price) from 5 Maroubra Bay Road, Pagewood.

Yours, etc.,

D. EVERINGHAM.

21 East Street,
Rockhampton,
Queensland.
March 23, 1956.

SIR: Why not English? Why not Basic English? See books by C. K. Ogden: "Basic English", "Basic for Science", and others. I have made an attempt to put your bit of Esperanto into Basic English. I did it in a very short time. An expert in Basic English would have done it much better. The English word for "nunas" is "now", not "recent". Every word in this letter (but not "recent", which was yours) and every word but three used for putting the Esperanto into Basic English are in the Basic list of 850 words. "Physiology" is "international" ("Basic English", page 71). "Fibre" is in the Basic Science List ("Basic for Science", page 283). "Uterus" is an "International Science Word" ("Basic for Science", page 313).

"The pains of birth. Starting-point and distribution of the pains from stretching the neck of the uterus. Work now being done at the bedside and on physiology gives us some new knowledge in causing the pain—(1) the full condition of the uterus (2) the force used by the neck of the uterus in stopping anything from being pushed out of the uterus."

My Esperanto word book has in it a great number of Esperanto root-words and a great number of rules for using them. My Basic word list has 850 Basic words. There are not a great number of rules for using them. The rules are simple. In addition to the 850 words in the Basic framework, there are 50 ordinary international words in everyday use, and there are the English names of days and months and numbers. There are in addition, for writing on science, 100 words covering the general language of science, and

50 words for any special branch. For reading and writing biology, for example, it will be necessary to have a knowledge of 1000 (850+100+50) English words. In addition, at a "higher" level there are a number of international science words, a knowledge of which is even now common to men of science all over the earth. Interlingua is Latin made simple by art. But it is no longer Latin. Basic English is English made simple. It is still English.

Melbourne,
March 22, 1956.

Yours, etc.,
H. THOMAS.

THE BRITISH MEDICAL ASSOCIATION AND ITS MEMBERS.

SIR: The sentiments expressed in the letter from Dr. J. McCulloch and in those of other correspondents must find an echo in the hearts of many of the profession. There is no doubt that we stand at a critical point, and we look in vain for leadership. An increasing sense of frustration is evident.

When the Medical Benefits Scheme was first introduced, it was understood by doctors that they would receive appropriate payment for services to any insured person, and indeed the scheme appeared to operate in this way in the beginning. Latterly the scheme has been interpreted differently, so that payment depends on the "classification" of patients treated in hospital into public, intermediate and private. This affects the whole profession, but is particularly hard on the country practitioner, as in most cases he is required to perform the services which in metropolitan hospitals are carried out by a paid residential staff. A ludicrous position has arisen out of this—either the payments by insured persons for whom no benefits are received in respect of hospital treatment are going to form a surplus, or the fund is paying the fees of private patients out of the contributions of public patients. It is of the highest importance to the profession that this anomaly should be corrected. It has been urged by local associations, but there is no evidence that any action has been taken on the point, or if so, what the results have been.

Thus the Medical Benefits Scheme is of relatively little use to doctors, since very few people pay who did not in any case pay before. Certainly the Medical Benefits Scheme was not introduced for the benefit of doctors. However, in a recent article in *The Sydney Morning Herald*, which almost certainly reflects the public mind, it is contended that doctors' fees should be held stable, despite our rising costs, and despite our forbearance in the past, because we have received "benefits" from the Medical Benefits Scheme. Thus imperceptibly the medical profession is being forced into the position of keeping its fees in accordance with a scale of fees fixed by bureaucrats in Canberra. In effect, we are being socialized. No protest of this has been forthcoming from the British Medical Association.

Another instance is the Pharmaceutical Benefits Scheme and the Pensioner Pharmaceutical Benefits. The regulations are, in some respects, idiotic. Medical practitioners have endeavoured to supply common sense to them, but now it appears that they are to be enforced more strictly. In a recent conversation with some of the pharmaceutical staff engaged in checking the prescriptions, we were informed: "Your own representatives agreed to these regulations." We would very much like to know who these representatives were. If they are not from the British Medical Association, why have we not had a protest publicly expressed?

Further instances could be quoted, involving workers' compensation and repatriation regulations, where these are interpreted by the agencies concerned to the disadvantage of the profession. There is no evidence that the British Medical Association has taken any cognizance of these matters.

As if the above instances were not enough, we were recently astonished to hear a proposal to limit Pensioner Medical Services, which was carried through in Parliament. Nothing could be more calculated to bring the profession into public disfavour. To make matters worse, it had very little practical application, as at present the amounts involved are relatively small.

One could be pardoned for assuming that there is very little interest on the part of the British Medical Association in the practical problems of the practitioner. It may be that many of those on the Council either have not been in general practice, or have not been in general practice for many years. Why does not the British Medical Association

follow the example of the trade unions and the churches and send responsible officials as liaison officers to visit the various centres, in order to gain a closer knowledge of the problems that they may have, and to inform the members of Association activities?

Yours, etc.,

J. B. GRAY,
R. A. MCGREGOR,
G. V. OXENHAM.

Griffith,
New South Wales,
March 5, 1956.

SIR: The annual election for the Council of the New South Wales Branch having just been held, it is pertinent to comment upon the method of election, the powers of Council and also upon the change of professional interests of the Branch's members.

Few members realize that the Articles of Association first saw the light of day in December, 1894, and these have been amended in unimportant details only since that late Victorian era. These details comprise a slight increase in the number of members of Council, with the addition of representation for two members each from metropolitan and country local associations and one each from the Public Service and women members.

The powers of Council remain the same; and if any member takes the trouble, and they should, to read them, they will find they are very wide, namely: Article 42 states . . . the management of the business and the affairs of the Association shall be vested in the Council . . . and the Council may exercise all such powers and do all such acts and things as the Association is by its Memorandum and Articles of Association or otherwise authorized to exercise and do. . . .

Few members realize also that the Branch is conducted under company law; although not secret this fact can hardly be said to be advertised. The Council is in fact the board of directors of the Branch. It is considered and conceded by all that when any non-profit making organization has a membership of over some hundreds and whose assets are considerable, it is advisable to form it into a company.

The original method of election for Council was the correct method in 1895. At that date the membership probably did not exceed 500, of which 90% undoubtedly were general practitioners; very few were consultants, and the members who were in the Public Service and those who were women would not exceed ten of each; country general practitioners might number 100. But what is the position today? The membership of the Branch exceeds 3650, and their interests are diverse. Consultants and Public Service and women members probably comprise half the membership, and even these branches have their own diversity of interests. Pathologists, radiologists and anaesthetists have their own peculiar medico-political and economic problems. Even the metropolitan and country practitioners have different interests.

It can be emphatically asserted that the only method by which the varying problems of the different sections described above can be rationally and expeditiously determined by Council, acting as it must by necessity under company law, is by direct representation, in proportion to their numbers, of these sections. Two arguments have been advanced against this proposal; one, that the Council might lose the advice of those members who previously had helped to guide the destinies of the Branch. In rebuttal of this it can be asserted that no section to whom they might belong could fail to recognize these services. The other argument is that of the expense of this type of election; this may be so, but it must be remembered that under sectional representation each member of Council will be an "instructed representative" of his/her section. This fact alone would render unnecessary the rather expensive conventions, plebiscites and the annual meeting of delegates. The real purpose of these meetings is to advise the Council of the opinions of the various sections of the Branch. The necessity of calling these meetings is sufficient proof that the Council over the last fifteen or more years is completely out of touch with the opinions and problems of the Branch's members. The term "instructed" representative is apparently repugnant to some members, but it must be clearly understood that members of Council elected to the Federal Council are themselves "instructed".

In my opinion I feel quite confident that direct representation would cure a growing apathy of members. Each

group or section will have its own representative, will feel that its opinions and problems will be presented to Council directly, and through its representative will be instructed as to the problems of other groups.

I am of the opinion that we are in the midst of a rapidly changing state of medical practice living as we are in a growing welfare State. Within the next ten years or less we will witness the demise of the honorary system, and it is of the utmost vital importance that the medical profession should be welded together to survive the inevitable political assaults upon the economic status of every member of the Branch.

The present reactionary method of the election of our Council, their admitted lack of knowledge of the wishes of the profession and the varying problems of the various sections leaves us wide open to defeat. It is up to the new Council to commence the "welding".

Yours, etc.,

C. H. JAEDE.

4 Robey Street,
Mascot,
New South Wales.
March 26, 1956.

AN UNUSUAL CASE OF TETANUS.

SIR: The middle ear is a recognized but rare site of entry of the tetanus bacillus, and the following case history demonstrates the way in which this may occur.

A five-year-old boy first developed right-sided earache on February 14, 1956. Four days later the ear started to discharge, and this continued up to the time of admission. On February 26 the child developed some difficulty in opening his mouth, and two days later he had his first generalized spasm. He was admitted to hospital on February 28 with typical, fairly severe, tetanus. There were no wounds or recent sores visible, but he had a profuse muco-purulent discharge from the right ear, in which there was an anterior perforation. Tetanus bacilli were cultured from the discharge. He was treated with antitetanus serum, antibiotics, sedation and "Myanesin", and on March 7 reexamination of the ear showed a foreign body which on syringing proved to be portion of a fly.

Closer questioning of the mother revealed that she had herself removed two flies from the ear a few days before admission. She explained that they were particularly prevalent because of the presence of a dairy farm on a neighbouring block.

The boy's condition improved, and by March 12 he was taking nourishment orally, and all sedation was stopped. There seems little doubt that the flies carried the infection into the ear, and this would explain the rather unusual portal of entry.

Yours, etc.,

I. S. WALLMAN.

Princess Margaret Hospital,
Perth,
March 13, 1956.

INTRINSIC FACTORS IN DISEASE.

SIR: Professor Inglis in his Maitland Oration (M. J. AUSTRALIA, March 17, 1956) calls attention to a series of familial dystrophies linked with fibrous moles. I was interested in this topic while attached to the New South Wales Division of Mental Hygiene, about 1949. I had to care for a Jewish patient with visible telangiectases of the face, asymmetric proptosis, and a visibly, palpably pulsating angioma of the occiput. He had dyspnoea, which seemed due to arterio-venous angioma of the lung, but a tomography arranged by courtesy of the Repatriation Department (via the Premier and the Prime Minister!) was negative. The patient had a history of recurrent meningeal bleeding from childhood, twice confirmed by lumbar puncture. This had produced hemiparesis and loss of power of bladder and both lower limbs. He had no proper education and seemed rather below average in native intelligence, but was also demented to some extent as evidenced by his fair vocabulary. He died recently at about sixty years of age. He had had several nose-bleeds, which constitute perhaps the most typical symptom of Osler's familial hæmorrhagic telangiectasia, and this diagnosis was supported by a history of intractable bleeding "piles" in the father, often operated upon, and frequent nose-bleeds in a brother, a businessman,

who kindly allowed me to examine him. I found no external angiomas in the latter except some hundreds of small, scattered, bright red capillary nævi. Another brother examined on that occasion, if my recollections are right, was noticeably duller than the business man and had no red nævi but several small neurofibromata. I arranged to see a nephew of my patient, an epileptic imbecile in another mental hospital, and found this boy to have multiple neurofibromata, including one on the palate. It seemed to me I had evidence for the occurrence by chance in the one family of two irregularly dominant dystrophies, one perhaps endothelial originally and the other perhaps glio-neurilemmal. But it is possible that there was a mutual exclusiveness about these two syndromes as well as a familial coincidence.

After transfer to another hospital I set about recording all nævi in my 500 patients, but the pressure of work and study precluded any conclusions before I left the department. However, my impressions are that well over 50% of chronic schizophrenic ("secondary dement") or "late dementia præcox" patients had multiple small red nævi, and less commonly brown or white (fibromatous) moles, whereas a considerable proportion of epileptics had neurofibromata. Brown moles were more common in alcoholics and manic-depressives who showed red nævi in less than 10% of cases. These, I repeat, are impressions which I hope will be further investigated.

Yours, etc.,

DOUGLAS N. EVERINGHAM.

21 East Street,
Rockhampton,
Queensland.
March 24, 1956.

TOOTH PICK INJURIES OF THE INTESTINAL TRACT.

SIR: Your "Current Comment" on the above subject in the Journal of March 24, 1956, has reminded me of other common methods of introducing timber to the human intestines.

When H.M.S. *Glory*, an aircraft carrier, visited Newcastle shortly after the last war, I removed a match-stick from the caecum of one of the ratings. He had no knowledge of ever swallowing a match, and the ship's surgeon was of the opinion that the stick had been embedded in a loaf of bread from the ship's bakehouse.

Another possible source of dangerous slivers is the wooden skewers with which the familiar week-end rolled roast or sirloin is interlaced. Butchers appear to take a pride in lopping the ends of the skewers in order to give the rolled meat a tidy appearance. The hidden skewers are hard to find when the meat is cooked. Often the carving knife will shear a thin slice from a skewer and present it neatly on the underside of a slab of meat, which is then placed on a plate to be garnished by the week-end vegetables and covered by gravy.

Last week I saw a child of five take a sharp piece of wood from her mouth and show it to her mother. It had come from a bag of salted peanuts.

It seems to be high time that the food-handling industries were informed of the unwitting hazards that they can offer to the public.

Yours, etc.,

THOMAS HAMILTON.

17 Bolton Street,
Newcastle,
New South Wales.

RECENT WORK IN HYPNOSIS AND ITS RELATION TO GENERAL PSYCHIATRY.

SIR: Touching the reference to Mary Baker Eddy and Christian Science in your issue of January 7, page 2, paragraph 6, second column. I do not think the lecturer would intentionally mislead his hearers or readers, and I desire to briefly submit the following facts. In one of her books, "Miscellaneous Writings", Mary Baker Eddy, the discoverer and founder of Christian Science and author of its text-book "Science and Health with Key to the Scriptures", writes (page 378), *inter alia*, re P. P. Quimby:

He proved to be a magnetic practitioner. His treatment seemed at first to relieve her, but signally failed in healing her case. Having practised homeopathy, it never occurred to the author to learn his practice, but

she did ask him how manipulation could benefit the sick. He answered kindly and squarely, in substance, "Because it conveys *electricity* to them." That was the sum of what he taught her of his medical profession. The readers of my books cannot fail to see that metaphysical therapeutics, as in Christian Science, are farther removed from such thoughts than the nebulous system is from the earth.

[Page 379 (*ibidem*.)] It was after Mr. Quimby's death that I discovered, in 1866, the momentous facts relating to Mind and its superiority over matter, and named my discovery Christian Science.

Mr. Lyman P. Powell, an Episcopal minister, in his book, "Mary Baker Eddy: A Life Size Portrait", said: "As a whole the system described in *Science and Health* is hers, and nothing that can ever happen will make it less than hers."

The lecturer recognized that Christian Science is an important factor in the lives of a great number of people, but Christian Science does not owe anything to mesmerism. Christian Science is based on the Bible. In the text-book (page 146) Mary Baker Eddy declares: "Divine Science derives its sanction from the Bible, and the divine origin of Science is demonstrated through the holy influence of Truth in healing sickness and sin." And further devotes a chapter "Animal Magnetism Unmasked", writes: "Christian Science goes to the bottom of mental action, and reveals the theodicy which indicates the rightness of all divine action, as the emanation of divine Mind, and the consequent wrongness of the opposite so-called action—evil, occultism, necromancy, mesmerism, animal magnetism, hypnotism."

In conclusion it would be reasonable to expect that the lecturer would be ready to use the foregoing in an endeavour to correct the statement made in his No. 1 lecture. Further it would be greatly appreciated if you would provide space in your next issue of *THE MEDICAL JOURNAL OF AUSTRALIA* to print this letter, for I am confident many of your readers would welcome this information.

Yours, etc.,

F. C. GARSIDE,
Christian Science Committee on
Publication for New South
Wales.

Kembla Building,
Margaret Street,
Sydney.

March 12, 1956.

LAY HYPNOTISM.

SIR: Is it not high time for an official check on the use of hypnotism by lay persons, particularly for exploratory purposes? In so far as suggestibility and imaginative tendencies may be increased by these procedures, I submit that the personalities of the subjects of hypnotism (who seem anyhow to recall only arrant rubbish) may come to develop spontaneous disturbances and divisions, and that especially in young subjects maturation may be set back. Popularization of hypnotism tends to discredit its legitimate use by medical practitioners as an exploratory and therapeutic agent. It should be noted that medical hypnotism, which has recently come into favour again in certain quarters, has been in and out of fashion many times in the last century.

Yours, etc.,

Sydney,
March 26, 1956.

W. S. DAWSON.

THE MIND AND THE BRAIN.

SIR: Had Dr. O'Day taken exception to certain of the inferences drawn and the conclusions reached by me—inferences and conclusions based on the facts (as I saw them) of nature and of experience—I would, of course, have conceded to him the same right as I claim for myself of seeking to arrive at truth by careful observation and logical inference; but when he pronounces an *ipse dixit* that (among other things for the introduction of which, he they defensible or indefensible, I was not responsible) "Telepathy constitutes a real obstruction to scientific observation", he is exhibiting, it seems to me, the sort of closed mind which would have had an exact counterpart if, at the beginning of

this century, a dyed-in-the-wool conservative physicist faced with the new evidence about radioactivity rejected it on the ground: "It contradicts the well-established axiom about the conservation of matter and energy."

My acceptance of telepathy as an evidenced fact has nothing to do with my interpretations, material or spiritual, of the cosmos, but derives only from a sincere attempt, free from a prior opinion, to reach conclusions based on the evidence. The evidence as supplied in abundance by the Society for Psychical Research—and there is other besides—seems to me conclusive till refuting evidence is forthcoming. Can Dr. O'Day supply such evidence? I wait with interest to see.

Yours, etc.,

CHAS. I. McLAREN.

4 Barry Street,
Kew, E.4,
Victoria.

March 14, 1956.

SIR: Dr. G. P. O'Day in your number of March 10 pulls no punches in his condemnation of "charlatany, superstition and witch-doctoring". Some years ago when a vogue of coquetting with the occult developed in Melbourne and much was heard of the power of thought in operating upon matter, I issued a challenge to any psychic enthusiast to deflect by mind action only a chemical balance in my laboratory to the extent of one one-thousandth of a gramme. There were no takers. I often told my students, if confronted with a Christian Scientist who declared that he could by spiritual means annul the action of any drug or poison, to give a hypodermic injection of apomorphine; then let the subject of such experiment resort to prayer and supplication as much as he liked, but have the basin ready.

Yours, etc.,

W. A. OSBORNE.

The Hall,
Kangaroo Ground,
Victoria.

March 15, 1956.

[This correspondence is now closed.—EDITOR.]

RESPIRATORY COMPLICATIONS OF ASCARIS INFESTATION IN FIJI.

SIR: In your issue of March 24 Dr. G. R. Hemming gives a most interesting account of respiratory disorders associated with ascaris infestation.

I wonder if he has considered the possibility of tropical eosinophilia (or, as I prefer to call it, the eosinophilic syndrome) as the real cause. In an experience of over a thousand cases in India, I formed the conclusion that this disease could cause asthmatic symptoms even at times when the blood picture was normal. Roy and I (1953) conducted a survey of 200 cases of high eosinophilia and found that ascaris ova were present in the stools of 66% of cases, compared with 47% of the general population. Other intestinal parasites, however, were also increased in incidence, while in many cases of high eosinophilia repeated stool examinations were negative, even in symptomatic cases.

We therefore came to the conclusion that the disease might be caused by a virus and be spread by droplets or by faecal contamination. This view could be supported by the occurrence of the condition amongst "in-laws" and amongst groups of people working together, yet having no direct link such as food.

It is of particular interest that Dr. Hemming's series shows 98% of cases among Indians. This may support the above suggestion regarding aetiology, as Ball (1950) has stated that about 90% of the recorded cases have come from that continent.

Perhaps further investigation of the families and neighbours of the known cases will bring to light eosinophile counts of 40% to 60% or more. Many of such cases, however, are quite asymptomatic and have to be specially sought after.

A further line of investigation would be in regard to the possibility of tuberculous infection in the families. We found this in 3% of our reported cases, and in a higher rate of a larger unreported series, while other writers have had the same experience.

Yours, etc.,

W. J. AITKEN.

2 Hawthorne Road,
Galloway's Hill,
Brisbane.

March 26, 1956.

References.

- AITKEN, W. J., and ROY, K. P. (1953), "The Eosinophilic Syndrome: An Epidemiological Study", *Tr. Roy. Soc. Trop. Med. & Hyg.*, 47:418.
- BALL, J. D., and TREU, R. (1950), "Tropical Pulmonary Eosinophilia", *Tr. Roy. Soc. Trop. Med. & Hyg.*, 44:237.

THE MANAGEMENT OF THE Rh-NEGATIVE MOTHER IN GENERAL PRACTICE.

SIR: Dr. G. A. Kelsall in commenting on my article on the management of the Rh-negative mother in general practice (*M. J. AUSTRALIA*, December 31, 1955) writes that 14.5% of immunized Rh-negative mothers under his care developed anti-Rh agglutinins after the thirty-fourth week of pregnancy. He states, therefore, that the reexamination of the maternal serum for anti-Rh agglutinins at the thirty-fourth week only, which is the routine practice at the Women's Hospital, Crown Street, is likely to lead to the "loss of many infants" from the unexpected development of haemolytic disease of the newborn. This has certainly not been the case, as the development of anti-Rh agglutinins after the thirty-fourth week of pregnancy has not occurred at the Women's Hospital, Crown Street, during eight years of routine testing. During that period of time two babies only have developed, unexpectedly, haemolytic disease of the newborn. In one instance the mother had been incorrectly blood grouped as Rh-positive, when in fact she was Rh-negative; therefore her serum was not examined for the presence of anti-Rh agglutinins. On the other occasion the presence of Rh antibodies in the maternal serum at the thirty-fourth week had not been detected. Reexamination of the serum taken at thirty-four weeks, and after delivery, had with the very greatest difficulty shown that agglutinins were present in both samples.

With the experience at the Women's Hospital, Crown Street, as a guide, it would seem that for practical purposes it is sufficient to examine the maternal serum for anti-Rh agglutinins at the sixteenth week and the thirty-fourth week only.

Nevertheless, in my article I did mention the procedure to be adopted should an infant of an Rh-negative mother unexpectedly develop signs arousing suspicion of haemolytic disease of the newborn.

Yours, etc.,

Brisbane,
March 21, 1956.

GEOFFREY M. BOURKE.

Obituary.

THOMAS FRANCIS RYAN.

SIR HUGH DEVINE has prepared the following appreciation of the late Dr. Thomas Francis Ryan.

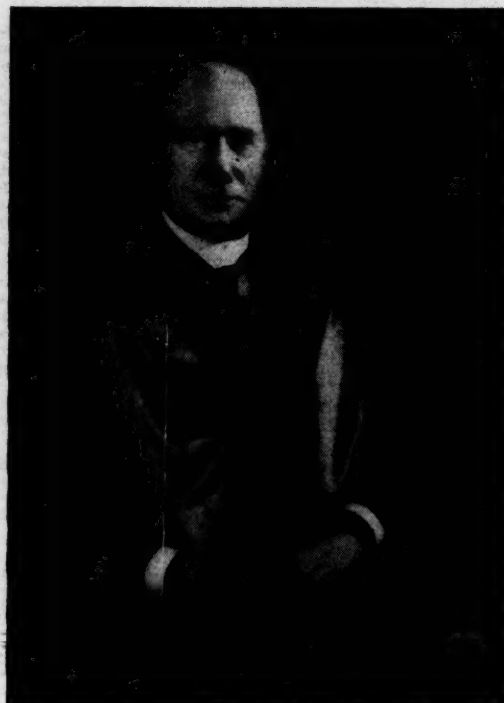
Dr. Thomas Francis Ryan died on December 7, 1955, at his home, "Lalla Rookh", Ararat, where he had lived since he had retired from practice in 1928. He was aged ninety-one years. He was the son of the late Michael Ryan, a well-known architect of Ararat, and of the late Margaret Ryan. He was educated at Ararat High School and graduated in medicine in 1886 at the University of Melbourne.

In the early part of his professional career he was closely associated with Dr. J. P. Ryan, a rather picturesque and well-known surgeon, who practised in Collins Street at that time. But his natural tendency was to practise in the country, and finally he settled at Kaniva, a straggling Mallee town. It was an attraction to him that his brother, Edward, was practising at Nhill, close enough to cooperate with him. Dr. Ryan's choice of Kaniva was, however, not altogether happy. His opening move was unfortunate. Inspired by his Collins Street experience, his dashing carriage and pair struck the wrong note; good as he was, the simple Kaniva people would have none of him; and times became hard. It was then a relief for him that, when his brother, Edward, left Nhill for overseas study, he could succeed to his thriving practice.

In Nhill, in a practice already made, his kindly humanity, his sense of service and his natural capability soon built up what was, in effect, a very large practice of the "clinic" type, which served a vast, thinly populated area of simply living people. He soon became not only their "beloved physician"

but also their friend and counsellor. He never married and devoted his whole life to his profession.

Dr. Ryan lived in a big verandaed house standing in a large garden, one wing of which formed the X-ray and pathological section. His was an original type of practice. The morning train brought patients from far and wide. They filled the rooms, the veranda and the garden, where they loitered and gossiped. They had come long distances, and they had long waits. Dr. Ryan would often have to leave them for calls. It was a homely atmosphere, and no patient ever went home without being satisfactorily examined. Patients whose troubles were inscrutable might spend days in the garden going to and from examining rooms until their problems were solved. The hotel in the back-ground served as an out-patient hospital.



It is not surprising that, in such an atmosphere, his diagnoses were accurate and the results of his treatments exceedingly good: not, only in surgery, in which he was deeply interested, but also in medicine, for arising from the wealth of his surgical experience was an overflow of thoughtful medicine, which made him a wise as well as a "beloved physician".

Very early in his career he built and staffed a private hospital, which he soon brought to a high peak of perfection by the training he expended on the staff. The money he made from his practice went back into it for the benefit of his patients.

His surgery was typical of the man. It was utterly safe. When he performed an operation, you could be sure that he was master of the situation. He was always in the van of surgical advances. He was the first outside Melbourne to have an X-ray department. In local anaesthesia he was a pioneer; it gave him plenty of time: he was a slow operator. He was the first to use Murphy's button. When Edward VII was operated on for appendicitis in 1901-1902, Dr. Ryan was practising as a routine prompt removal of the appendix which was acutely inflamed.

In his forty years of practice he had seen only one fracture of the neck of the femur. "A sound country and therefore sound human stock", he thought. He was expert in the surgery of osteomyelitis, antrum and mastoid, and was very keen on wiring fractures.

As surgical difficulties accumulated and remained unsolved, Dr. Ryan would take a few months off and engage in some

research—generally anatomical—in an endeavour to improve his surgery. He was at home at the anatomical school at the University of Melbourne, where he was once a demonstrator.

Dr. Ryan was a foundation Fellow of the Royal Australasian College of Surgeons and a Fellow of the American College of Surgeons. He was chairman of an earlier Government cancer research organization. He represented the Royal Australasian College of Surgeons at a Pan-Pacific Surgical Conference and read a paper on 64 cases of hydatid, two of which were hydatid of the brain, on which he had successfully operated in 1911.

He did much to improve the nursing service in the country. He also founded several important scholarships—two at Saint Vincent's Hospital and one at the Melbourne Hospital, where he was trained. His reasons for this were that he had strong feelings about the practicality of the university course in medicine, and about the freshly graduated student, who he thought knew more about gastrectomy and such-like types of knowledge than he did about the common ills of general practice. To counteract what he thought was a weakness in the medical course he founded £10,000 worth of scholarships, to follow closely on graduation. There was a set practical examination—written and clinical—for what was entitled the Ryan Prize, worth £100. This went to the graduate best equipped with practical surgical knowledge. In detail the scholarships were as follows: at Saint Vincent's Hospital, the Michael Ryan Scholarship in surgery in memory of his father and the Margaret Ryan Scholarship in medicine in memory of his mother; at the Melbourne Hospital, where he was educated, the J. P. Ryan Scholarship in surgery in memory of his elder brother.

Dr. Thomas Ryan was a Knight Commander of Saint Gregory the Great, an honour conferred on him by Pope Pius XII. He was a member of the Athenaeum Club. He was the finest of the fine type of country surgeons of the early nineties and was deeply endowed with the spirit of service to the sick.

REGINALD SPENCER ELLERY.

We are indebted to Dr. Ian Martin for the following account of the career of Dr. Reginald Spencer Ellery.

At 9.12 p.m. on Tuesday, December 27, 1955, the life of Dr. R. S. Ellery came to an end in the Alfred Hospital, the hospital he had served as honorary psychiatrist. So ended the courageous and productive career of a pioneer spirit in Australian psychiatry. He had followed close upon the first psychiatrists in Australia to bring scientific understanding of psychological principles to the treatment of psychiatric disorders. The deep sympathy of his insight into the emotional conflicts at the source of neurosis and psychosis was matched by his sensitive appreciation of the distorted interpersonal relationships between the patient and those around him. Ellery shared with other keen observers the acumen to read the signs and portents by which many people unwittingly disclose much that they refrain from telling, and otherwise seek to conceal. This ability to peer through the veils of reticence and to penetrate the masks of pretence was matched by a benevolent tolerance and a helpful kindness toward those who sought his aid.

Many monuments to the humour, humanity, erudition and poetry of the man remain in his writings. The authorship of R. S. Ellery has provided many an enjoyable contribution to scientific programmes and journals. The fresh originality of his viewpoint is a challenge to the student. The careful observation, the studied meditation and the literary polish, which combined to produce the finished work, were also apparent in his conversation. At his desk in the ease of his comfortable library, surrounded by his magnificent collection of books, he cultivated the arts of reading, writing and discourse, and he enjoyed music. It was thus that I came to know him and thus will remember him, quiet, creative and sincere.

In his life and work, Reg Ellery was essentially creative. Combining an avid thirst for knowledge with a quick intuitive grasp of the essentials and of the fruitful, he read widely and effectively. His fertile and creative imagination forged essays of scientific value and literary distinction, leavened with a delightful, often Puckish humour. In his large and successful practice, he was quick to note, inquire into and apply any newly developed methods of investigation and treatment. Always sensitive of human values, he would brook no neglect or unkindness in the management of

patients, however feeble-minded or deranged they might be. His name is linked with the development in Australia of both physical methods and systematic psychotherapy. He fostered the development of the Melbourne Institute of Psychoanalysis, the first in Australia, and remained one of its directors.

Dr. John K. Adey was warmly regarded by Reg Ellery as his first and lasting teacher and guide in penetrating the veils of the minds of men distorted by psychological illness. Soon after he joined Dr. Adey's staff at Sunbury Mental Hospital, they engaged in applying the malarial fever therapy for general paralysis of the insane, introduced in 1917 by Wagner Jauregg in Vienna. In writing to Dr. Adey, Professor Robertson, of Edinburgh University and Morning-



side Hospital, had added a postscript: "Have you tried Malarial Treatment for G.P.I.? It is well worth trying." After fruitless casting about for a source of malarial infection, it was learned that a seaman, suffering from benign tertian malaria, had been admitted to the Williamstown Hospital. Forthwith, on May 26, 1925, Ellery journeyed from Sunbury to collect malarial blood from the febrile mariner. Thus began the successful introduction of Wagner Jauregg's fever therapy in Australia.

Restricted in the narrow confines of medical practice in the Lunacy Department, as it was then known, Ellery expanded to the broader challenge of individual private medical practice. While abroad, he visited centres of note and men of fame in his chosen speciality. He was able to meet Wagner Jauregg and tell him of the successes in Melbourne of his malarial fever therapy. A visit to Vienna yielded a glimpse of Sigmund Freud at an upstairs window; but Freud's infirmity prevented a meeting; however, a charming reception by Freud's famous daughter, Anna, and the sight of Freud's overcoat and stick had to suffice. In the winter of 1937, in a technical bookshop, Ellery was shown a book fresh from the press. This bore the title "Die Konvulsionstherapie der Schizophrenie", by Dr. Ladislav von Meduna. This led him hotfoot to Meduna at the Royal Hungarian State Psychiatric Institute, where Meduna demonstrated his new treatment, cardiazole shock therapy, to him, the first visiting colleague to enjoy such an experience. Later he visited Dussek in Vienna, Sakel being in America at the time, then Frostig in Warsaw and Mueller in Berne. While in England, subsequently, he described Meduna's work to Noel Harris, and on his return to Australia, introduced Meduna's treatment in his private practice in Melbourne while it was yet scarcely known elsewhere.

His life, marked by creation, achievement and success, was saddened by crippling disability, then fatal disease, and was

darkened by reverses. None of these daunted his spirit, stunted his mind or embittered his heart. The life of a sensitive man, with brilliance and with vision and courage, in a world where obtuseness and vacillation play so large a part, seldom flows in a tranquil course. From the rough waters, Ellery emerged more deeply aware of the ways of mankind, and did not forget what no man of integrity can condone. Mistakes he accepted with charity and tolerance; malice he rejected with contempt.

Reg Ellery chose to die as courageously as he had lived, without meanness, complaint or rancour, in the face of great suffering and a premature end. He did not clutch at the straws of unsubstantial palliative postponements of the inevitable. Grateful for his measure of life, he did not grasp for more, nor did he lament his fate. He thanked his physician, comforted his loved ones, then went his way, letting Nature take its course.

MILTON LEONARD COUTTS.

We are indebted to Dr. Cedric Swanton for the following appreciation of the late Dr. Milton Leonard Coutts.

Dr. Milton Leonard Coutts died on February 19, 1956, in his sixty-third year.

Milton Coutts was born at Boort in Victoria on August 21, 1893. He was educated at Carlton College, Melbourne, matriculated early, and then became engaged in pastoral work on the family property. He subsequently studied engineering at the School of Mines at Bendigo, but in 1912 he decided to make medicine his career and enrolled at the University of Melbourne. He graduated in 1917 and was later appointed superintendent of the Fremantle Hospital. He subsequently went into general practice, in partnership with his life-long friend, Dr. Palmerston Rundle, at Nyah West in Victoria, where he remained for five years.

His interest in oto-rhino-laryngology first became stimulated by his association with Herbert Gray, of Perth, and with the late Dr. Frank Andrews, of Melbourne. In 1926 he came to Sydney to take over Dr. Allan Walker's practice at Summer Hill. He was appointed honorary ear, nose and throat surgeon to the Renwick Hospital for Children and also the Western Suburbs District Hospital, and he remained on the staff of the latter hospital until his death. Milton Coutts inaugurated the bronchiectasis clinic at this hospital, and directed it for something like twenty years. He was later appointed an honorary ear, nose and throat surgeon to the Marrickville and Canterbury District Hospitals, and endoscopist to the Randwick Auxiliary Hospital and the Waterfall Sanatorium. During the last war he was appointed relieving ear, nose and throat surgeon to the Royal Alexandra Hospital for Children.

Dr. Coutts was a Fellow of the Royal Society of Medicine and of the American College of Chest Physicians, and just prior to his death he had accepted an invitation to read a paper to the American College at the annual congress in June of this year.

In 1930, during a visit to England, he made the contacts which, after Herbert Gray, of Perth, and Frank Andrews, of Melbourne, his early teachers, most significantly influenced the direction in which his natural aptitudes were given expression. F. C. Ormond, now Professor Ormond, became a lifelong friend and adviser, and undoubtedly stimulated what became, in later life, his second great interest—tuberculosis.

At the Victoria Park Chest Hospital, London, he saw A. S. Scott Pinchin and H. V. Morlock at work. At this time, comparatively little could be done for the unfortunates with chronic suppurative disease of the lungs, such as bronchiectasis. Some who, in latter years, have ridiculed attempts to alleviate the lot of the bronchiectatic by bronchoscopic aspiration and lavage, must forget that for many years, and in fact until comparatively recently, when lung surgery became more selective and less hazardous, this was the best that could be done; and Dr. Milton Coutts, in his application of his great natural abilities to this type of work, rapidly became an expert of the very highest rank in all aspects of peroral endoscopy. His fine technique was also reflected in his meticulously kept and systematic records.

As a developing scene wrought changes in the treatment applicable to the bronchiectatic, he diverted more and more attention to tuberculosis, particularly in its endobronchial aspects, where his skill was of great assistance in observing the changes in the larger air passages in the course of this disease. At the time of his death he was planning to publish some of his findings.

As an indication of his attention to technical detail and skill, it is noted that in something like 20,000 bronchoscopies performed with local anaesthesia, he never had a death from overdosage of the anaesthetic agent. This is probably an all-time world record.

Dr. Milton Coutts was a man of wide interests. He was interested in languages, he was a very keen golfer, and in middle life he became a leading ice-skater. And he had a workshop equipped with power tools, which he handled expertly. He was generous in friendship, was an amusing and original companion and was affectionately regarded by his patients. His wife, formerly Dr. Lalla Mills, of Melbourne, survives him.

The College of Radiologists of Australasia.

THE THOMAS BAKER MEMORIAL FELLOWSHIP FOR RADIOLOGISTS.

THE Council of The College of Radiologists of Australasia has been empowered by the trustees of the Thomas Baker (Kodak), Alice Baker and Eleanor Shaw Benefactions to select a Fellow for a period of study abroad. The purpose of the Fellowship is to allow a qualified radiologist to further his knowledge by study in the United Kingdom. It is not intended that the Fellow should obtain further academic qualifications during the tenure of the Fellowship; but he may arrange to stay overseas for a further period for this purpose. The conditions are as follows:

1. The value of the Fellowship is £1500 (Australian).
2. The Fellow shall be a British subject, a graduate of a university in Australia or New Zealand, and should hold the Diploma of the College of Radiologists of Australasia or a recognized radiological diploma and preferably a higher medical degree.
3. The tenure of the Fellowship shall be fifteen months.
4. The Fellow must be prepared to take up the Fellowship and leave for overseas by July 1 of the following year after his election. He shall also give an undertaking that within two years of granting of the Fellowship he will return and engage in the practice of radiology in Australia or New Zealand for at least two years.
5. He shall furnish a report to the Council on his return.
6. The Fellow may elect to further his studies in either radiodiagnosis or radiotherapy.

Applications for this Fellowship must be made by the last day of June, 1956, to the Honorary Secretary, The College of Radiologists of Australasia, British Medical Association House, 135 Macquarie Street, Sydney, from whom application forms may be obtained.

Naval, Military and Air Force.

APPOINTMENTS.

THE undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Number 10, of March 1, 1956.

AUSTRALIAN MILITARY FORCES.

Australian Regular Army.

Royal Australian Army Medical Corps.

3/40110 Captain J. M. McKenna is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Southern Command), 30th December, 1955.

To be Captain, 10th January, 1956, with a Short Service Commission for a Period of One Year.—1/8072 Fergus Roy Wilson.

Citizen Military Forces.

Northern Command.

Royal Australian Army Medical Corps (Medical).—The provisional appointments of the following officers are terminated: Captains 1/25223 B. Bruce-Smith, 14th May,

1955: F1/1017 M. R. Edye, 16th September, 1955; and 1/39173 H. R. West, 22nd October, 1955. 1/61846 Captain (provisionally) N. P. Cleeve is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Eastern Command) in the honorary rank of Captain, 29th December, 1955. To be Captains (provisionally): 1/25222 Bruce Bruce-Smith, 15th May, 1955; F1/1017 Mary Rae Edye, 17th September, 1955; and 1/39173 Harold Reginald West, 23rd October, 1955. 1/67935 Captain J. A. Nye is appointed from the Reserve of Officers, 6th December, 1955.

To be Major, 20th December, 1955.—4/31906 Captain (Temporary Major) M. W. Elliott.

1/61852 Honorary Captain J. F. O'Duffy is appointed from the Reserve of Officers, and to be Captain (provisionally), 22nd November, 1955. To be Captains (provisionally): 1/39190 Rowland Norman Gale, 22nd November, 1955, and 1/61769 Lawrence John Lowth, 13th January, 1956.

Eastern Command.

Royal Australian Army Medical Corps (Medical).—2/56843 Captain (provisionally) A. H. Gibson is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Eastern Command) in the honorary rank of Captain, 31st December, 1955. The provisional ranks of the following officers are confirmed: Captains 2/165473 J. E. D. Goldie and 2/127892 G. W. Burgess. To be Captains (provisionally), 4th January, 1956: 2/130116 Mark Xavier Shanahan and 2/146607 Noel George Arnott.

2/127024 Captain D. C. Maddison is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Eastern Command), 20th October, 1955.

To be Captain (provisionally), 13th January, 1956: 2/79316 Francis Houstoun Lang.

Southern Command.

Royal Australian Army Medical Corps (Medical).—3/157151 Lieutenant-Colonel H. A. Phillips is appointed to command 2nd General Hospital, and to be Temporary Colonel, 24th December, 1955. 3/157150 Colonel C. A. Renou relinquishes command 2nd General Hospital, 23rd December, 1955, and is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Southern Command), 24th

December, 1955. The provisional appointment of 3/101026 Captain J. W. C. Riddell is terminated, 10th September, 1955. To be Captain (provisionally), 11th September, 1955: 3/101026 John Walter Carre Riddell.

5/26400 Captain (provisionally) M. N. Orton is seconded whilst undergoing post-graduate studies in the United Kingdom, 15th May, 1955. 5/26400 Captain (provisionally) M. N. Orton ceases to be seconded whilst undergoing post-graduate studies in the United Kingdom, 10th November, 1955. The provisional appointment of 5/26400 Captain M. N. Orton is terminated, 14th May, 1955. 3/107706 Captain (provisionally) M. Drake relinquishes the provisional rank of Captain and is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Southern Command) in the honorary rank of Captain, 9th November, 1955. To be Temporary Lieutenant-Colonel, 24th December, 1955: 3/157155 Major R. S. Lawson. To be Captain (provisionally), 15th May, 1955: 5/26400 Mervyn Noel Orton.

Western Command.

Royal Australian Army Medical Corps (Medical).—5/10586 Captain N. H. M. Colyer ceases to be seconded for post-graduate studies in the United Kingdom, 30th November, 1955. To be Temporary Major, 1st December, 1955: 5/10586 Captain N. H. M. Colyer.

Reserve Citizen Military Forces.

Royal Australian Army Medical Corps.

Northern Command.—The resignation of Honorary Captain J. Woodley of his commission is accepted, 6th December, 1955. To be Honorary Captain, 9th January, 1956: Selim Abraham Mellick.

Southern Command.—The resignation of Major J. D. Hicks of his commission is accepted, 27th October, 1955. To be Honorary Captains: Bruce Sutherland, 7th November, 1955; Peter Ellis Campbell, 28th November, 1955; and Douglas Malcolm Ritchie and Jon David Rosenthal, 5th December, 1955.

To be Honorary Captains: Graeme Roderick McLeish, 12th September, 1955; William Moncrieff Crosby, 13th September, 1955; John Farquhar McDonald, 10th October, 1955; William

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED MARCH 31, 1956.¹

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia.
Acute Rheumatism ..	8(1)	4(1)	..	..	1	..	..	..	8
Amoebiasis ..	..	..	..	..	..	..	..	..	..
Ancylostomiasis ..	..	..	9	..	..	..	..	..	9
Anthrax ..	..	..	..	..	..	..	..	..	..
Bilharziasis ..	..	..	..	..	..	..	..	..	..
Brucellosis ..	..	2(1)	..	1	..	..	..	..	3
Cholera ..	..	..	..	..	..	..	..	..	..
Chorea (St. Vitus) ..	..	1(1)	..	..	..	..	..	..	1
Dengue ..	..	..	..	..	..	..	..	..	..
Diarrhoea (Infantile) ..	3(3)	8(7)	2(2)	..	..	..	..	..	13
Diphtheria ..	..	2(2)	1	..	2(1)	..	..	..	5
Dysentery (Bacillary) ..	..	..	6(5)	..	2	..	..	..	8
Encephalitis ..	2(2)	..	..	..	..	..	..	..	2
Filariasis ..	..	..	..	..	..	..	..	..	..
Homologous Serum Jaundice ..	..	..	..	..	..	..	..	..	..
Hydatid ..	..	..	..	..	..	..	..	..	..
Infective Hepatitis ..	72(38)	48(20)	..	30(9)	9(4)	1	4	..	104
Lead Poisoning ..	..	..	2	..	..	..	..	..	2
Leprosy ..	..	..	..	..	..	..	..	..	..
Leptospirosis ..	1	..	4(1)	..	..	..	..	..	5
Malaria ..	..	..	1	..	..	..	..	..	..
Meningococcal Infection ..	1	..	..	1(1)	..	..	..	..	3
Ophthalmia ..	..	..	..	..	5	..	..	..	5
Ornithosis ..	..	..	..	..	..	..	..	..	..
Paratyphoid ..	..	..	..	..	..	2	..	..	2
Plague ..	..	..	..	..	..	..	..	..	..
Polio-myelitis ..	11(6)	10(9)	5(3)	6(1)	10(5)	1(1)	..	1	44
Puerperal Fever ..	..	..	2	..	..	..	..	..	2
Rubella ..	..	9(3)	..	5(3)	1	..	..	..	15
Salmonella Infection ..	..	..	..	..	..	..	..	..	..
Scarlet Fever ..	9(5)	10(6)	2(1)	9(8)	1(1)	1	..	..	32
Smallpox ..	..	..	..	..	..	..	..	..	..
Tetanus ..	..	..	..	..	..	..	..	..	..
Trachoma ..	..	..	..	..	6	..	..	..	6
Trichinosis ..	..	..	..	..	..	..	..	..	..
Tuberculosis ..	27(13)	11(8)	10(2)	3(3)	8(7)	7(8)	..	1	67
Typhoid Fever ..	..	..	..	..	..	..	..	..	..
Typhus (Flea-, Mite- and Tick-borne) ..	..	..	..	..	1(1)	..	..	..	1
Typhus (Louse-borne) ..	..	..	..	..	..	..	..	..	..
Yellow Fever ..	..	..	..	..	..	..	..	..	..

¹ Figures in parentheses are those for the metropolitan area.

Gerald Coverly Maling, 2nd November, 1955; and Robert Andrews Leggett, 7th November, 1955.

Eastern Command.—The notification respecting Honorary Captain John Field Laycock which appeared in Executive Minute No. 58 of 1955, promulgated in *Commonwealth Gazette* No. 16 of 1955, is withdrawn.

The following officers are placed upon the Retired List (Southern Command) with permission to retain their rank and wear the prescribed uniform: Lieutenant-Colonel L. H. Ball, 16th November, 1955; and Honorary Captain M. Ashkenazy, 9th February, 1954.

Congresses.

AMERICAN HEART ASSOCIATION.

The thirty-second annual meeting and twenty-ninth annual scientific sessions of the American Heart Association will be held in Cincinnati, Ohio, from October 27 to October 31, 1956. Those wishing to present either papers or scientific exhibits at the sessions must submit abstracts or make application to the Association's Medical Director no later than Tuesday, May 15, 1956. Papers intended for presentation must be based on original investigation in or related to the cardio-vascular field. The abstracts should offer in summary form the results obtained and the conclusions reached. Application forms and further information are available from the Medical Director, American Heart Association, 44 East 23 Street, New York 10, New York.

Australian Medical Board Proceedings.

TASMANIA.

The following have been registered, pursuant to the provisions of the *Medical Practitioners Act*, 1938-1955, of Tasmania: Bond, Betty, 1955 (Univ. Melbourne); Barclay, William Arthur, 1954 (Univ. Sydney); Conaghan, John Peter, 1954 (Univ. Sydney); Connock, Richard, 1955 (Univ. Sydney); Lorang, John Erik, 1955 (Univ. Sydney); Shand, John Wentworth, 1955 (Univ. Sydney); Stretton, Leonard Thomas, 1953 (Univ. Queensland); Wald, Marx, 1955 (Univ. Sydney); Muscio, Peter Alan, 1954 (Univ. Sydney); Foster, Felder Thomas, L.R.C.P. and L.R.C.S. (Edinburgh), 1955, L.R.F.P.S. (Glasgow), 1955; Douglas, Bruce Stuart, 1955 (Univ. Sydney); Jordan, Geoffrey Ellis, 1954 (Univ. Sydney); Yee, Laurence Radford, 1955 (Univ. Sydney); Russo, Joseph Francis, 1955 (Univ. Melbourne); Lyons, Francis Xavier, 1955 (Univ. Melbourne); Philpott, Ian Ronald, 1955 (Univ. Melbourne); Smith, Garnet Oliver, 1955 (Univ. Melbourne); O'Rourke, Francis Joseph Thomas, 1955 (Univ. Melbourne).

Nominations and Elections.

The undermentioned has applied for election as a member of the New South Wales Branch of the British Medical Association:

McGovern, Gregory Joseph, M.B., 1953 (Univ. Sydney), 5 Trafalgar Street, Stanmore, New South Wales.

Asprey, Raymond Vincent, M.B., B.S., 1954 (Univ. Sydney), Mater Misericordiae Hospital, Crow's Nest, New South Wales.

The undermentioned have applied for election as members of the South Australian Branch of the British Medical Association:

Barker, Denis, M.B., B.S., 1955 (Univ. Adelaide), 23 Stirling Street, Tusmore, South Australia.

McLeay, Leslie Margaret, M.B., Ch.B., 1936 (Univ. Manchester), River Road, Goolwa, South Australia.

The undermentioned have been elected as members of the South Australian Branch of the British Medical Association: Burton, Patrick Andrew, M.B., B.S., 1955 (Univ. Adelaide); Lynch, Martin Alfred, M.B., B.S., 1954 (Univ. Adelaide).

Medical Appointments.

Dr. G. C. Smith and Dr. A. W. Morrow have been appointed members of the Poisons Advisory Committee constituted under the provisions of the *Poisons Act*, 1952, of New South Wales.

Deaths.

The following deaths have been announced:

YOUNGER-ROSS.—Isabella Younger-Ross, on April 2, 1956, at South Yarra, Victoria.

SCHMIDT.—Egmont Theodor Carl Schmidt, on April 9, 1956, at Bundaberg, Queensland.

Diary for the Month.

APRIL 21.—Victorian Branch B.M.A.: Country Branch Meeting.

APRIL 24.—New South Wales Branch, B.M.A.: Ethics Committee.

APRIL 26.—South Australian Branch, B.M.A.: Scientific Meeting.

MAY 1.—New South Wales Branch, B.M.A.: Organization and Science Committee.

MAY 2.—Victorian Branch, B.M.A.: Clinical Meeting.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales.

Queensland Branch (Honorary Secretary, B.M.A. House, 22b Wickham Terrace, Brisbane, B17): Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 80 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205 Saint George's Terrace, Perth): Norseman Hospital; all contract practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

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